Egypt, Ethiopia, and the Nile

Understanding Egypt´s Refusal to Renegotiate the 1929 and 1959 Agreements Concerning Rights and Allocations of the Nile

Andreas Holm Røsberg

Master´s Thesis

The Department of Political Science

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Abstract

The Nile Basin is home to an enduring conflict between upstream states and downstream states. The core of this conflict revolves around the 1929 and 1959 agreements. These two agreements, which underline the downstream states "natural and historic" rights, are the de jure foundation of Egyptian and Sudanese claims to nearly all the waters of the Nile. Left out are the eight upstream states. While these states previously had to tolerate the 1929 and 1959 agreements, albeit grudgingly, increasing economic growth and political stabilization in some of these states have enabled them to challenge the status quo in spite of downstream protest. This is particularly the case with Ethiopia, which is currently building what is to become the largest dam in Africa on the Blue Nile, the Grand Ethiopian Renaissance Dam (GERD). Despite the increasing challenge to the traditional status quo in the basin, Egypt has refused outright to make concessions of any kind. This thesis seeks to explain why Egypt refuses to renegotiate the 1929 and 1959 agreements through three interconnected yet distinct analyses.

The first analysis assesses the changes in the balance of power between Egypt and Ethiopia in the period of 1990 to 2012. If this balance was still in Egypt´s favor it could be argued that Egypt had no reason to renegotiate. The analysis shows, however, that considerable changes indeed have occurred, particularly since the late 1990s or early 2000s. The second analysis uses simple non-cooperative game theoretic models to assess three options Egypt has, given the changes in the balance of power that have occurred. Here it seems like renegotiation and the establishment of a cooperative arrangement in the basin is Egypt's best alternative. Both of these analyses assume, however, that the state is a unitary rational actor. The third and final analysis shows that there are quite severe domestic restraints on the Egyptian decision makers regarding a renegotiation of the 1929 and 1959 agreements. If these restraints are severe enough, and they may appear to be, then Egypt is near entrapped and the path to a mutually beneficial solution to the conflict may be very difficult and time consuming to reach.

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Map of the Nile Basin

Map of the Nile River Basin (http://nileis.nilebasin.org)

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1.0 Introduction

The Nile is the longest river in the world stretching from the heart of Africa and into the Mediterranean. The Nile and its many tributaries are the main source of water for millions of people in eleven different countries. Egypt has historically been the most powerful state in the basin with nearly unchallenged hydro-hegemony. This is, however, no longer the case. Several upstream states, Ethiopia in particular, have experienced significant economic growth and increasing political stability in the last couple of decades. This appears to have affected the balance of power within the basin and could as such be assumed to affect the bargaining positions of the states. Egypt has not, however, changed its position and continues to claim de jure validity of key agreements from 1929 and 1959. Why is Egypt refusing to accept a new agreement concerning allocations and rights on the Nile River? This thesis will argue that the Egyptian position seems appropriate until the end of the 1990s or early 2000s when the balance of power was still in Egypt´s favor. As the balance of power apparently has turned in Ethiopia's favor after this point in time the continued Egyptian refusal to renegotiate becomes somewhat of a puzzle. It seems like a renegotiation of the 1929 and 1959 agreements, and the establishment of a cooperative regime is preferable to a continuation of the current situation and the risk of military confrontation. This thesis argues that the preferences and power of the domestic audience severely limits the Egyptian government´s room for maneuver on this issue. This restricted room for maneuver has resulted in an entrapment situation where Egyptian policy makers are unable to engage in cooperation even if they wanted to.

1.1 Why Study Negotiations Concerning the Nile?

The allocation of the Nile is regulated by various international agreements, of which the 1929 and 1959 agreements are the most important. These agreements are greatly beneficial to Egypt and the Sudan while preventing increased use of

the water resources for the other states in the basin. Increasing economic growth and political stability has resulted in an increased demand in the upstream countries for a renegotiation of the allocation of the freshwater resources of the Nile. The hydrological conflict in the basin is predominantly between the downstream states that wish to maintain their beneficial status quo, and the upstream states that argue that a new agreement must be negotiated resulting in a more equitable allocation. The upstream states argue that such an allocation can contribute to the much-needed socioeconomic development of the entire basin. The outcome of this conflict is likely to affect millions of people in various ways, and has the potential for serious political conflict between the riparian states, although it may not result in interstate resource war.

Despite the importance of the conflict it seems that certain aspects of it are understudied. This thesis attempts to contribute to the understanding of this large and complex conflict by asking why Egypt does not change or moderate its bargaining position in the basin given changes that have occurred since 1990. A clearer understanding of the dynamics behind Egypt´s position may be beneficial in current as well as future conflicts and negotiations in the basin.

1.2 Research Question

This thesis seeks to answer why Egypt has not changed its bargaining position in the basin-wide conflict regarding rights and allocations of the Nile. Given the significant changes in the balance of power between the basin´s most important antagonists, Egypt and Ethiopia, since the 1990s the lack of Egyptian change of position is something of a puzzle. The main research question of this thesis is therefore:

Why is Egypt refusing to renegotiate the 1929 and 1959 agreements?

In order to develop a possible answer to this larger and quite extensive question this thesis will discuss the following sub-questions:

- Has the balance of power between Egypt and Ethiopia changed since 1990 and what are the main causes of this change?
- What are Egypt´s options and which of these are most beneficial to Egypt given the changes that have gradually occurred since the 1990s?
- Is the Egyptian refusal to renegotiate the result of internal political factors?

The research question satisfies two important criteria for research in the social sciences: real world importance and contribution to scholarly literature (King, Keohane and Verba, 1994: 15). First of all it is important in the real world due to the fact that the outcome of the conflict will affect the lives of the people who live along the Nile and its tributaries in some shape or form. While sub-question one has been dealt with explicitly in quite a lot of scholarly literature this is not the case for the two remaining sub-questions. Researching this thesis I found a few sources dealing explicitly with these questions and they appear to be underexplored if not unexplored. The research question is informed by and overlaps with established scholarly literature, ensuring that the second criterion is satisfied.

1.3 Choices Made

Several choices regarding how the research question was to be approached were made early in the research process. These initial choices have therefore been significant for the thesis as a whole. Given their importance the choices, and the reasoning behind them, may be of some interests to the reader. The following pages give a brief introduction to choices regarding the selection of actors, the definition of the period of interest, and finally, the analytical approach.

The Nile basin consists of eleven states. Including all of these states in the analytical approach would be very difficult within the frames of a thesis on the master's level. I have therefore chosen to focus almost exclusively on Egypt and Ethiopia. It is obvious that Egypt should be included as a primary actor. That Ethiopia should be included is less obvious, and may need further explanation. The primary reason for choosing Ethiopia as a unit is that 80-90% of all the

water that reaches Egypt originates within the borders of Ethiopia. Ethiopia is therefore hydrologically the most important state in the basin (Cascão, 2009: 256; Tvedt, 2012: 380). Ethiopia has also experienced considerable economic growth and political stabilization during the last decades. It seems like Ethiopia is the most likely contender to the current arrangement in the basin (Cliffe, Love, and Tronvoll, 2009: 153-155).

A particular period of interest was chosen as an in depth analysis of the conflict for the entirety of its duration is beyond the scope of this thesis. For this particular thesis the period of interest begins in 1990 and ends in 2012. There are several reasons for starting in 1990. First, the chance of any real challenge to the Egyptian hydro-hegemony in the basin from the upstream states was negligible before this point in time (Heikal, 1978: 175). Second, the fall of the Mengistu regime in Ethiopia and of the Soviet Union in 1991 dramatically changed the regional as well as the global political landscape. This historical turning point is suitable as a starting point (Freund, 1998: 260; Brown, 2010: 549-550). Finally, the People's Republic of China, which has been vital to the Ethiopian hydro-development capability, did not become a major actor in Africa before the 1990s (Taylor, 2004: 267). These three factors make 1990 a suitable starting point. The reason for ending in 2012 is less complex. There is simply a lack of varied and reliable academic work related to the situation following the years after the Arab Spring.

The final choice presented here regards the analytical approach, or more accurately analytical approaches, of this thesis. I have chosen to approach the research question by engaging in three interconnected yet distinct analyses. Each of these analyses aim to answer one of the sub-questions presented above, and as such contribute to finding a possible explanation to the larger research question. This has resulted in a somewhat unconventional structuring of the thesis. The three analyses are based on different theoretical frameworks or analytical approaches, and because of this there is no theory chapter in the thesis. The theoretical or analytical approach used for a given analysis is instead presented in the relevant analytical chapter. This choice was made in order to

reduce the amount of pages between the presentation of a particular theoretical framework of analytical approach and its actual analytical use.

The first analysis assesses the changes in the balance of power that have occurred between Egypt and Ethiopia since 1990. An assessment of this is important as much of the theory on international negotiations assumes that a state's bargaining position is determined, or significantly influenced, by that state's power-base. The balance of power between Egypt and Ethiopia is obviously asymmetrical if assessed on the basis of traditional determinants of power such as economic and military resources and capabilities. This analysis is instead based on William Mark Habeeb´s (1988) framework for explaining the outcome of apparently asymmetric negotiations. If the balance of power has not changed in Ethiopia's favor since 1990, or not changed sufficiently in this direction, this could be assumed to explain the Egyptian refusal to renegotiate existing arrangements.

The second analysis seeks to determine the Egyptian costs and gains from three different options given the results from the first analysis. Non-cooperative game theory is the analytical approach used for this analysis. The primary reason for this choice is that game theory is well suited to present strategic interaction between rational actors in a structured manner.

The third and final analysis shifts perspective from the international to the national. The first two analyses are based on the assumption that the state is a unitary rational actor. The third analysis leaves this assumption behind and examines possible domestic determinants of the Egyptian refusal to renegotiate the 1929 and 1959 agreements. This analysis is primarily based on Robert Putnam´s (1988) depiction of international negotiations as a two level game and the concept of win-sets.

1.4 Outline of the Thesis

The thesis is made up of seven chapters, of which the introduction constituted the first. In the second chapter the methodological framework is presented with special attention given to the issues of reliability and validity. The third chapter presents vital background information on hydrology, the 1929 and 1959 agreements, previous cooperative attempts in the basin, as well as the Egyptian and the Ethiopian experiences in the decades leading up to 1990. The fourth chapter is the first out of three analytical chapters and it assesses the occurrence and causes of changes in the balance of power between Egypt and Ethiopia in the time period 1990-2012. Chapter five uses simple non-cooperative game theoretic models to evaluate three different options available to Egypt given the changes in the balance of power that occurred in the time period 1990-2012. Chapter six, which is the last analytical chapter, attempts to explain the Egyptian refusal to renegotiate by evaluating the size of the Egyptian win-set and the possible restrictions on the Egyptian bargaining position this win-set may have. Chapter seven summarizes the findings in the three analytical chapters and concludes.

2.0 Methodology

2.1 Research Design

In the process of answering the chosen research question this thesis will make use of several established theories of international relations in general and international negotiations in particular. As such the research design is very similar to what Levy (2008) labels a *theory-guided case study*. In this form of case study the objective is to explain or interpret a particular case, guided by theory, rather than generate generalizable results (Levy, 2008: 3-5).

This thesis uses a qualitative methodological approach in order to answer the research question. This approach was chosen for two reasons. The first, and most important, is that a qualitative approach ensures a larger degree of flexibility compared to a structured quantitative design. A qualitative approach has enabled me to develop the research question, collect data, and engage with the analysis simultaneously throughout the research process. New interesting elements and dynamics have appeared several times throughout the research process and being able to incorporate these into the paper has been vital (Hellevik, 2002: 110; Bryman, 2004: 283). The second reason for choosing a qualitative design is that many of the variables presented in relevant theory are near impossible to quantify in any fruitful manner, let alone find reliable data for. In the end the choice of research design and methodology depends on the chosen research question (Aberbach and Rockman, 2002: 673), and it seems like the case of the Egyptian refusal to renegotiate the 1929 and 1959 agreements does not lend itself as well to statistical analysis as it does a qualitative approach.

2.2 Collection of Data

Literature studies and interviews are the two main sources of data for this thesis. Data collected through a thorough study of existing literature on the conflict, the actors, and the region make up the backbone of the data. The use of such

preexisting data is in some cases problematic as one has little control over how they were generated. The assessment of the reliability and validity of the material needs to take this into consideration (King et al., 1994: 27-28). While some of the sub-questions are dealt with explicitly in scholarly literature others are not so to the same extent. Data collected through interviews have been used to supplement the data from the literature study in these cases. The data has been structured with the help of relevant theory and, what I would argue to be, reasonable deductions from this theory.

2.2.1 Academic Literature

The use of preexisting text as a source of data is common in the social sciences and is also the primary source of data for this thesis (Ryghaug, 2002: 302). Where this has been possible the data has been collected from peer-reviewed articles in scientific journals or published books.

2.2.2 Interviews

Interviews are appropriate to gain information that is difficult to find, or simply not available elsewhere (Andresen, 2006: 138; Aberbach and Rockman, 2002: 674). This is also the primary reason why interviews were chosen as a means of collecting data. The data collected through interviews was also used to validate data from the literature study as well as bridging together different aspects of the conflict handled by the literature. The form of interview chosen for this thesis is the semi-structured (elite) interview. The main reason for choosing this form of interview is that it ensures a degree of flexibility, enabling new elements to appear, while at the same time maintaining some structure to the situation.

The respondents were not chosen randomly, but rather as key informants with extensive knowledge of the conflict, the actors, and the region (Andresen, 2006: 136). For this thesis three interviews as well as several less formal conversations were conducted in Oslo in the period 22/01/2014 to 25/02/2014. The list of

respondents is presented in Appendix 1 and the interview guide is presented in Appendix 2.

2.2.3 Field Study

This thesis could potentially have benefitted significantly from a period of field-study as the collection of new and project-specific data is almost always better than the use of preexisting data (King et al., 1994: 27). Such a study was, however, not conducted. The primary reason for this is the limitation of time available for this study. Gaining access to respondents could be very time consuming, especially given the current political situation in Egypt. Even if such access were achieved there is no guarantee that meeting with Egyptian respondents would result in data that is not available elsewhere. Being conscious of this uncertainty and the limited time available to write this thesis I chose not to conduct a field-study.

2.3 Reliability

The concept of reliability refers both to the degree of exactness or credibility of data in a given research project and the use and interpretation of this data. A high degree of reliability means that the same procedure will lead to the same result if the process is repeated[1] (King et al., 1994: 25; Lund, 2002: 108). With a qualitative research design it is often difficult to estimate the degree of reliability as neither the collection of data nor the analysis follows a set of predetermined rules. Some of the many challenges to reliability, and the measures taken in an attempt to counteract the impact of these challenges, are described in the following paragraphs.

[1] Reliability is therefore closely connected with replicabiliy/reproducibility, another important scientific or academic virtue (Krippendorff, 1980: 21).
[2] This type of validity is therefore near identical to the terms measurement validity (Adcock and Collier, 2001: 529) and narrow measurement validity (Skog, 2004: 89).

2.3.1 Reliability and Data from Academic Literature

It can be argued that there are two major and interconnected challenges for the reliability of data collected from academic literature. The first challenge is the tendency of treating such data with a low degree of critique. Although a book has been published or an article published in an academic journal does not necessarily mean that data collected from it is all true, partially true, or the only truth (Ryghaug, 2002: 302-304). The second challenge, to some extent related to the first, concerns the importance of context and meaning. The meaning a given reader is left with from reading an article or book chapter is not necessarily the same as that of another reader, or even the writer of that article or chapter. Another reader might have collected different data from the same source (Krippendorff, 1980: 22-24; Ryghaug, 2002: 306-307).

2.3.2 Reliability and Interviews

The form of interview conducted for this thesis is the semi-structured interview. This form of interview is located somewhere between the structured and the unstructured interview in its ability to secure reliable data. Maintaining some degree of flexibility permitted new elements to come to light and was highly useful for the purpose of this thesis. The cost of this flexibility is, however, its impact on the degree of reliability. Among the many challenges to ensuring reliability for semi-structured interviews are trustworthiness and meaning, the same as for data from academic literature (Berry, 2002: 680; Andersen, 2006: 140).

2.3.3 Ensuring Some Degree of Reliability

Several precautions were made in order to increase the reliability of the analyses of this thesis. *Triangulation* is the primary tool of doing so. Although originally an approach in quantitative research aimed at ensuring more exact measurements, it is now used in qualitative research as well. Triangulation is in this particular project conducted by crosschecking a particular "piece" of data with several

other independent sources of data (Bryman, 2004: 275). The basic logic behind triangulation as a means of assessing the degree of reliability is that an observation or fact is more reliable the more support it has from independent sources.

A second important means of ensuring reliability has been to spend significant amount of time not only finding relevant data, but in an attempt to understand the context it was found in. This was found challenging as I, with the perspectives and perceptions of a political scientist, have collected data from sources generated by historians, anthropologists, economists, bureaucrats, and more. This means that there might be inaccuracies or outright mistakes in both the data and their analysis although care has been taken in order to enhance the reliability.

In the end one has to accept that a qualitative case study research design is unable to secure the same degree of reliability as a strictly structured quantitative design. By reporting the data collection process and referring to the sources used it becomes possible for the readers themselves to assess the methodological choices, the collection and interpretation of the data, and therefore the degree of reliability (King et al., 1994: 23-26, 51).

2.4 Validity

The concept of validity is used and defined differently by various researchers resulting in a quite complex and ambiguous concept (Adcock and Collier, 2001: 529). The assessment of the validity of this thesis is based on Cook and Campbell´s system of validity, as it is presented by Torleif Lund (2002). This system of validity is chosen as it is quite rigorous, commonly used, and straightforward to understand. Cook and Campbell´s system of validity is made up of four validity types or requirements, which individually can be obtained or secured to a higher or lower degree. The four types of validity in this system of validity are *concept validity*, *internal validity*, *external validity*, and finally *statistical validity* (Lund, 2002: 105). Out of these four only the first three are of

relevance for this thesis. Statistical validity is excluded, as it is simply not possible to obtain with a qualitative research design.

2.4.1 Concept Validity

This type of validity concerns whether the operationalized variable covers all relevant aspects of a concept and nothing more, or in other words that one is measuring what one intends to measure[2] (Lund, 2002: 106). There are two key concepts in this thesis where concept validity is problematic as the concepts are very complex and in reality determined by a near immeasurable number of variables. These are the concepts of *bargaining power* and *win-set*.

Concept Validity and Bargaining Power

The key concept of bargaining power, particularly important for the analysis presented in chapter 4.0, is highly complex and to include *all* relevant aspects of the concept into the operationalized variable is beyond the scope of this thesis. Bargaining power is instead operationalized in accordance with the theoretical framework presented by William Mark Habeeb (1988), making the variable manageable while at the same time maintaining the key elements of the concept. The same key elements were also presented in independent academic literature as well as mentioned in interviews without the respondents being told that this theoretical framework would be used. This is interpreted to mean that a significant degree of concept validity has been ensured for the concept of bargaining power.

Concept Validity and the Egyptian Win-set

The key concept of win-set, an important concept in the analysis presented in chapter 6.0, is presented by Robert Putnam (1988). This concept refers to the range of agreements possible between the actors in an international negotiation

[2] This type of validity is therefore near identical to the terms measurement validity (Adcock and Collier, 2001: 529) and narrow measurement validity (Skog, 2004: 89).

that are acceptable to the domestic audience of these actors[3]. Putnam argues that the size of the win-set of a given state on a given issue is determined by the power and preferences of the domestic audience. The concept is therefore another highly complex concept that is near impossible to operationalize completely. The sources, however, seem quite coherent in the claim that many Egyptians perceive the maintenance of the traditional status quo as important for economic, security, and socio-cultural reasons. Focusing on these key preferences can be assumed to exclude many important preferences. I argue nevertheless that the operationalization of the concept win-set based on these three key preferences can function as a proxy for the larger and more complex *real* Egyptian win-set.

2.4.2 Internal Validity

This type of validity concerns whether the relation between various variables is of a causal nature or not (Lund, 2002: 106). Gerring (2005) argues that a core definition of causality suitable for the social sciences is that a cause (X) has to raise the *probability* of effect (Y) occurring. This probabilistic, rather than a deterministic, definition of causality is used in this thesis. As this thesis seeks to explain Egyptian behavior securing a high degree of internal validity is considered very important. A qualitative case study research design is quite apt at identifying causality. In depth studies of a single case can secure a high degree of internal validity as it enables identification of processes and possible mechanisms that may not have been found by a research design focusing on breadth and the possibility of generalization (Gerring, 2007: 43; George and Bennet, 2005: 21-22). The complexity of the case is, nevertheless a challenge for the internal validity as it increases the possibility of omitted variable bias. It is possible that a seemingly causal relationship is influenced by variables not included in the study (King et al., 1994: 10, 28; Skog, 2004: 75-80).

[3] A further explanation of the concept of win-sets is presented in section 6.1

The omitted variable bias is quite serious as this thesis aims to secure a high degree of internal validity. The primary measure taken to reduce the threat of serious omitted variable bias is the use of established theory in the collection of variables. Such theories are, at their best, structured and well-developed frameworks that direct attention to key aspects of some given phenomenon while ignoring less important elements (Levy, 2008: 4; King et al, 1994:29). Collecting data based on such theories is assumed to reduce the chances for highly important variables to be excluded from the study. That variables pointed out by the theory also were pointed out as significant by independent literature and the respondents is taken to mean that the threat of serious omitted variable bias is reduced to an acceptable level. The threat of this bias is still present, however, and any readers of this thesis should be aware of this when reading the main analytical chapters.

2.4.3 External Validity

This type of validity concerns the possibility of making non-statistical generalizations to and across various populations, times, and/or situations (Lund, 2002: 206). This thesis attempts to explain a single case, a research design that is generally unsuited to ensure a high degree of external validity. Some may argue that research in political science should result in either the construction or testing of generalizable theories. I would argue, however, that understanding the reasons behind the Egyptian refusal to renegotiate the 1929 and 1959 agreements is highly important in its own right and therefore the low degree of external validity is not problematic.

2.5 Summary

This chapter has presented the main methodological choices as well as the challenges of this thesis. While the main strengths of the chosen research design and method are a relatively high degree of concept and internal validity, the main challenges are concerned with external validity and to some extent reliability. This is the result of a focus on depth rather than breadth in this thesis.

I have argued that the chosen research design, in spite of some challenges, is the most appropriate one for answering the research question.

3.0 Background

While the list of relevant and interesting elements concerning the issue treated by this thesis is huge, there are a few elements that stand out as particularly important for understanding the context. These elements are the Nile itself, the argument concerning whether or not cooperative arrangements regarding shared water resources is possible, existing agreements concerning the basin, cooperative attempts and the Nile Basin Initiative, and finally the political and economic situation in Egypt and Ethiopia as well as the relation between the two states in the decades before 1990.This chapter provides the necessary background to these themes.

3.1 The Nile

The Nile is the world's longest river and its water basin is shared by Egypt, Sudan, South Sudan[4], Ethiopia, Eritrea, Kenya, Tanzania, Rwanda, Burundi, Uganda, and the DRC. The Nile River, or river system, is made up of several tributaries. The two most important are the White Nile, which originates in central Africa with Lake Victoria as the main source, and the Blue Nile, flowing down from Lake Tana in the Ethiopian highlands. Out of these two the Blue Nile carries the most water. In fact between 89-90% of all the water that flows into Egypt originates in Ethiopia. The Blue and the White Nile merge near Khartoum in Sudan before running north through Egypt and into the Mediterranean Ocean (See the map on p. XI)(Yohannes and Yohannes, 2013: 195; Tvedt, 2011: 101-102). While the Nile is long, more than 6600 km depending on how it is measured, it is not large in the sense of its discharge. The annual runoff of the Congo is 1250 km^3 and that of the Volta is 390 km^3, while the Zambezi and the Niger have an annual runoff of 230 km^3 and 180 km^3 respectively. The annual runoff of the Nile is only 84 km^3 and is therefore relatively modest compared to other great African rivers (Swain, 2011: 688).

[4] South Sudan became independent after a referendum in 2011.

The Nile is subject to two hydrological paradoxes. The first paradox is that flooding occurs between June and September when the rainfall in Egypt is near non-existent. Homer, for this reason, called the Nile "Egypt's heaven-descended spring" and Livingstone found it miraculous (Jeal, 2011: 23). This phenomenon has puzzled scholars from antiquity and into modern times. The reason of the paradox is now known to be the result of rains upstream. (Di Baldasarre et al., 2011: 201-203; Cascão, 2009: 256; Tvedt, 2012: 380). Hardly any of the water originates in Egypt itself. Although Egypt is a major water *consumer* in the basin it is not a *producer*. The second paradox of the Nile is that the upstream states historically have been much weaker than the downstream states, and particularly Egypt (Tvedt, 2014, [Interview]). Both of these paradoxes have been fundamental in the formation of the conflict regarding rights and allocation of the water resources between the states in the basin.

Although Egypt historically has been the most powerful state in the basin its vulnerable hydrological position, downstream to all other riparian[5] states in the basin, becomes apparent to anyone who visit Egypt. The river runs through the country creating a line of blue water and limited belt of green agricultural land on both banks. Beyond is the desert. This was also noticed by Winston Churchill, who compared Egypt to a "deep-sea diver whose air is provided by the long and vulnerable tube of the Nile" (Tvedt, 2004: 37-38).

3.2 Is Cooperation Possible?

One of the central assumptions of this thesis is that true cooperation between states that share a common freshwater source in the form of a transnational waterway is a possibility, although it in many instances is difficult to achieve. Is this assumption reasonable?

Towards the end of the cold war the security concept was broadened in order to include issues such as the environment and access to natural resources (Jordan,

[5] Relating to or situated on the banks of a river.

Taylor, Meese, and Nielsen, 2009: 550; Homer-Dixon and Deligiannis, 2009: 310). Freshwater rapidly became an area of concern for the security communities, as there in many cases are no feasible alternative sources of supply, no alternative to the resource itself, and all human economic activity, as well as survival itself depends on it (Snow, 2010: 381-382). Access to resources, and the access to freshwater in particular, became integrated into the two main strands of theory of international relations, realism and liberalism. These two major theoretical approaches to the study of international relations have resulted in two widely diverging views on the outcome of a situation where a source of freshwater is shared by two or more states.

Realists see the international community of states as a highly dangerous place where power, and predominantly military power, is sought as the main means of survival. In this setting agreements do not count for much, particularly when they concern the sharing of resources. The competition for resources, both within and between states, leads instead to an increasing level of conflict. This situation, inspired by the Hobbesian view of the "state of nature", is combined with a Malthusian argument resulting in the water-war paradigm. The main argument is that increased use of water, an ultimately finite and vital resource, due to population growth and industrialization will eventually threaten the security of states and result in armed conflict (Jordan et al., 2009: 5-6; Warner, 2012: 175-176; Homer-Dixon and Deligiannis, 2009: 312; Gleick, 1993: 82). Liberalism predicts another outcome of shared water-resources. They argue that states in many cases have a common interest in cooperation rather than conflict and that this is true for water-resources as well (Poulsen, 2007: 152-153; Warner, 2012: 179-180).

While the water-war paradigm may be intuitively reasonable, and indeed gained a significant amount of followers in the 1990s, there are very few actual instances of the conflicts that it predicts. There are hardly any cases of interstate conflicts motivated by water resources alone. There are, however, a vast number of cooperative arrangements concerning shared waterways and other freshwater sources (Wolf, 1998: 253-258). This does not mean that limited

water resources will not motivate armed interstate conflict in the future. Although there are many examples of cooperative arrangements there are also a number of unsolved conflicts. While it seems fair to argue that most of these conflicts are unlikely to become violent they may remain unsolved (Zeitoun and Warner, 2006: 436).

The relationship between Egypt and Ethiopia has throughout the period of interest for this thesis been characterized by non-violent, although quite often hostile, conflict. Given that most such conflicts are resolved through cooperation or remain unsolved, and do not as realists claim tend to end in armed conflict, this thesis assumes that cooperation between Egypt and Ethiopia is a possibility or at the very least that the conflict is unlikely to become an armed conflict.

3.3 Existing Agreements

It has proven notoriously difficult to establish binding international law regulating transnational waterways. The Nile is, however, subject to several agreements concerning rights and water allocation. Out of these, two agreements are arguably the most important both in scope and in their relevance for negotiations in the basin[6]. These are the 1929 Anglo-Egyptian *Nile Waters Agreement* and the 1959 *Agreement for the Full Utilization of the Nile Waters*. These will in this thesis be referred to simply as the 1929 and the 1959 agreements.

The 1929 agreement was the result of negotiations between the British Empire and Egypt and has proved to be a blessing for some of the riparian states and a curse for others. There are two main aspects to this agreement. First, Egypt recognized Sudan´s, at this time a British colony, right to use an increased amount of the waters of the Nile. Second, Britain accepted that Egypt had "*natural and historic rights*" to the waters of the Nile and stated that the safeguarding of these rights was a fundamental principle of British policy. The amount of water flowing into Egypt was not to be affected negatively. The

[6] For a more through presentation of all agreements between the Nile basin countries see (Hefny and El-Din Amer, 2004: 49-50).

agreement includes specific allocations of water – 48 billion m^3/year to Egypt and 4 billion m^3/year to Sudan (12:1 allocation), which in total makes up the entire usable annual discharge of the Nile. Britain signed not only on behalf of the Sudan but also on the behalf of her other colonies in the basin (Kenya, Tanzania, Uganda). Imperial Abyssinia (Ethiopia), the most important water producer in the basin, was not a signatory and refused to acknowledge it (Tvedt, 2004: 141-148; Hefny and El-Din Amer, 2004: 49; Mekonnen, 2010: 432).

Sudan did not, however, come well out of this bargain and resentment against the 1929 agreement grew until it was rejected in 1958 by the government of the newly independent Sudan. The main arguments for the Sudanese rejection were the skewed allocation and the construction of the Aswan High Dam in southern Egypt. A new agreement, intended to replace the 1929 agreement, was therefore negotiated and finally signed in 1959. The main difference between this new agreement and that of 1929 is a reallocation securing 55 billion m^3/year to Egypt and 18.5 billion m^3/year to the Sudan. The 1959 agreement also reinforces Egypt's claim to "natural and historic" rights. It is similar to the 1929 agreement in that it ensures a de jure monopoly on the waters of the Nile to Egypt and the Sudan (Mekonnen, 2010: 435; Cascão, 2009: 245; Hefny and El-Din Amer, 2005: 50; Yohannes and Yohannes, 2013: 199; Tvedt, 2011: 102).

These two agreements have become Egypt´s redline in all negotiations concerning the Nile ever since. Ethiopia has on their side maintained its position, refusing to acknowledge the agreements. Other upstream states have done so after independence, arguing that the 1929 and 1959 agreements are inherently colonial in nature (Mekonnen, 2010: 434; Yohannes and Yohannes, 2013: 200). The 1929 and 1959 agreements have outlived British colonialism, Nasserism, and the cold war and continue to be the backbone of the hydrological conflict in the basin. Egypt and the Sudan, who are downstream states and major consumers of water, wish to maintain the status quo based on these agreements. The upstream states, including Ethiopia, wish to change this status quo and establish a system based on equitable utilization rather than on historic and natural rights (Cascão, 2009: 245). They argue that the inclusion of "natural and

historic" rights in a new arrangement will make that arrangement nothing more than old wine in new bottles.

3.4 Cooperative Attempts and the Nile Basin Initiative

There have, despite the conflict between upstream and downstream states, been several attempts at cooperation in the Nile Basin. Hydromet (Hydro-meteorological Survey of the Catchments of Lakes Victoria, Kyoga, and Mobuto Sese Seku[7]), Undugu, and TECCONILE (Technical Cooperation Committee for Promotion of the Development and Environmental Protection of the Nile Basin) are all examples of inter-basin cooperative institutions. While these have had limited success the Nile Basin Initiative (NBI), established in 1999, initially showed much more promise (Arsano and Tamrat, 2004: 19; Collins, 2006: 118; Mekonnen, 2010: 423-425; Cascão, 2009: 246)

The Nile Basin Initiative (NBI) is different from the earlier cooperative institutions concerning the Nile river basin. The most important difference is that the NBI includes all the states in the Nile river basin. For the first time Ethiopia and Egypt attempted to cooperate, or at least negotiate, on Nile issues within a formal framework. The NBI was supposed to function as a transitional mechanism for cooperation until a permanent cooperative framework is established (Mekonnen, 2010: 425). The intended formal functions of the NBI are to increase trust and cooperation through a Shared Vision Program and financially supporting national hydro-development through a Subsidiary Actions Program. With the NBI program it seemed that Nile cooperation was entering a new and more productive era (Cascão, 2009: 246; Arsano and Tamrat, 2005: 19-20; Hefny and El-Din Amer, 2005: 45).

Parallel to the workings of the NBI the member states were negotiating a new Cooperative Framework Agreement (CFA) which when concluded would enable the establishment of a permanent cooperation institution – the Nile Basin Commission (NBC). When and if the CFA is ratified by all basin states, the NBC

[7] The current name of Lake Mobuto Sese Seku is Lake Albert or Albert Nyanza.

will have legal and institutional authority regarding the use, development, and protection of the Nile water resources (Yohannes and Yohannes, 2005: 202; Cascão, 2009: 247). The negotiations began in 1997 and were completed in 2007. It has, however, not been accepted by all basin states. The main sources of disagreement are still the 1929 and 1959 agreements. The most contested article of the CFA as it stands is article 14(B) which states that the states should work to: "…ensure that all states achieve and sustain water security and not to significantly affect the water security of any other Nile basin state". Egypt and the Sudan claim that this is a too severe break with the status quo and have insisted on a change in the article to: "…not to adversely affect water security and current uses and rights of any Nile basin state" (Yohannes and Yohannes, 2013: 203). Unless all members of the NBI are willing to make compromises and limit their unilateral ambitions this cooperative regime or forum may break down (Cascão, 2009:262-264; Røsberg, 2013a).

3.5 Egypt and Ethiopia in the Decades Before 1990

The importance of the Nile for Egypt is perhaps best exemplified through the connection between the High Aswan Dam and the Suez Crisis of 1956. Gamal Abdel Nasser, the leader of the Free Officers coup against King Farouk in 1952, perceived the realization of the plans for the High Aswan Dam as vital to the future development of Egypt. The Americans, and later the British, withdrew their promises of financial support, in an attempt to force President Nasser from what they interpreted to be a pro-Soviet stance. Nasser's reaction to the broken promise was the nationalization of the Suez Canal (The Suez Canal Company), which in turn resulted in the Suez Crisis (Meredith, 2006: 39-40; Tvedt, 2012: 91-92; Lapidus, 2002: 524). President Nasser´s reaction came as a tremendous surprise to the West, who had underestimated the importance of Nile control for the new Egyptian leadership.

Egypt was, without a doubt, the single most powerful state in the Nile basin during the cold war. Even defeat in the Six Day War in 1967 did little to change this fact (Lewis, 1995: 365). Egyptian power in the basin grew as the Aswan High

Dam finally was completed in 1971 with the assistance of Soviet specialists. Egypt was also able to make peace with its primary enemy, Israel, with the American brokered Camp David accords in 1979. This not only ensured peace with Israel but also made Egypt an important ally of the United States, securing financial and military support until the end of the Cold War and beyond (Lapidus, 2002: 526-527).

The Ethiopian experience during the Cold War was very different from that of Egypt. Before the Ethiopian revolution in 1974, Ethiopia was technologically retarded as well as highly politically fragmented. Emperor Haile Selassie, while enjoying prestige abroad, maintained control through a feudal system based on aristocratic, landowning families and the Ethiopian Orthodox Church. Weakness in the imperial structure became apparent as famine struck Wollo province in 1973 and the government did nothing to alleviate it. The famine was followed by mutinies in the army as well as general popular protest in large parts of the country in 1974. A group of radical officers calling themselves the "Derg", eventually lead by Major Mengistu Haile Mariam, conspired to take control and dethroned the Emperor Haile Selassie on September 12th 1974. He died, or was possibly murdered, in his cell the following year (Meredith, 2006: 206-216; Freund, 1998: 250).

While the Egyptian revolution had been virtually bloodless and maintained the social structure of the Egyptian society, the Ethiopian revolution was very different. Marxism-Leninism was proclaimed the national ideology and wide reaching change was initiated resulting in a collapse of the old order and rebellion against the central government[8]. By the late 1970s the revolutionary government had lost control in Eritrea, at the time a province in Ethiopia, and in 1977 was nearly defeated by attacks from Somalia aimed at recapturing the Ogaden Province. Rapid intervention by the Cuban and Soviet allies of the regime saved it from total military defeat. The intervention did not, however, manage to

[8] Some of the groups that rebelled against the new Derg government were the Ethiopian Democratic Union (EDU), Afar Liberation Front (ALF), Tigray Liberation Front (TLF), Oromo Liberation Front (OLF), and the Western Somali Liberation Front (WSLF) (Meredith, 2005: 245).

stop ongoing and future rebellion against the central government (Meredith, 2006: 244-247; Freund, 1998: 251; Brown, 2010: 367).

The 1980s were even more challenging for the Ethiopian revolutionary government, where Mengistu gradually had asserted near absolute control through several purges. Famine struck Ethiopia again in 1984-1985[9], partially due to continued armed conflict in several areas. Relief was deliberately delayed in order to starve out combatants in the affected areas. When confronted with the atrocities by the international community, Mengistu initiated a migration program forcing thousands to move to collective farms in the more fertile south. What was indented as a solution to rebellion became another grievance that fuelled further armed resistance (Meredith, 2006: 331-334, 337, 343). The Soviet Union, one of the main supporters of the Mengistu regime, began a gradual retreat from Africa in the same period (Brown, 2010: 367). When Mengistu went to Moscow in 1988 to ask for more support he was turned down and sent home. The combined force of various armed groups overthrew the regime, now without Soviet support, in 1991 and Mengistu Haile Mariam was forced into exile. The new political regime was headed by Meles Zenawi, who would become a member of the "new generation" of African leaders of state (Brown, 2010: 366-367; Meredith, 2006: 386-387; Freund, 1998: 260; Eidhammer, 2012: 69-70).

Whereas Egypt came out of the Cold War with a peace deal with Israel, American support, and what appeared to be a stable hegemony in the Nile Basin. Ethiopia on the other hand was weakened by decades of neglect from both imperial and communist governments and a devastating twenty year long civil war.

3.6 Previous Research

I have not found any academic research explicitly aimed at explaining why Egypt refuses to renegotiate the 1929 and 1959 agreements. There are, however, a number of scholars from a wide variety of academic disciplines who have

[9] The drought in 1984-85 occurred in a particularly dry decade. The flow of the Nile plunged between 1978 and 1988 and Lake Nasser shrunk to their lowest level since construction.. While the water returned in the 1990s a decade of regional drought is likely to happen at some point in the future (Collins, 2006: 121).

worked on issues and topics relevant for answering this question. The two most important fields for this thesis are those of history and international relations.

The writings of various historians are an important background for this thesis. It Appears little historical work exists regarding the relationship between these two states and the Nile. The notable exception is the work of Terje Tvedt, which has been immensely important in writing this thesis. These readings have been supplemented by other, and less topic-specific, sources including work on topics such as Islamic societies in the Middle Ages, the colonization and de-colonization of Africa, as well as more contemporary history of the two states.

There is quite a lot of academic literature, within various factions of international relations, concerned with the changes of power in the basin between Egypt and Ethiopia as well as the possibilities of cooperation. While much of the previous research relevant for this thesis is located in the academic disciplines of history and international relations they are not the only fields of interests. Research within international law, regional and local hydrology, economics, local politics, etc. have also been important sources of information without explicitly referring to the research question of this thesis.

4.0 Analysis 1: Changes in the Balance of Power

This thesis seeks to answer why Egypt does not change its position in conflicts concerning rights and allocations of the Nile River. Power is the major determinant of the degree of control over water-resources in the anarchic international system, particularly due to the fact that shared water resources are not covered by international law (Zeitoun and Warner, 2006: 436; Snow, 2010: 45; Tvedt, 2011: 116). As stated in the previous chapter Egypt has been the hydro-hegemon of the Nile for a very long time and has generally been able to ensure that its interests were secured. Egypt would not need to change its position unless this hydro-hegemony was challenged one way or another. As Egypt has not changed its position, it can therefore be assumed that the balance of power between Egypt and Ethiopia has not changed since 1990 and that the Egyptian hydro-hegemony is still strong. Is this the case? If on the other hand a change in the balance of power has occurred, then the unchanged Egyptian position becomes a puzzle, as it cannot be fully explained by the balance of power between Egypt and Ethiopia.

This first analysis of the paper argues that there has indeed been a change in the balance of power between Egypt and Ethiopia between 1990 and 2012. The balance of power between these two states is assessed based on a theoretical framework by William Mark Habeeb (1988) that is suited to analyze apparently asymmetrical negotiations. The core of Habeeb's argument is that power determinants relevant to the given negotiated topic are equally, if not more, important than general power determinants such as economic and military factors. The outcome of a negotiation therefore depends not only on the aggregate structural power of a state but also on the issue-specific structural power. It can be argued that the Egyptian hydro-hegemony and the status quo stated in the 1929 and 1959 agreements since 1990 has become increasingly challenged by upstream states, and Ethiopia in particular. The change in the balance of power has not, however, occurred within the traditional aspects of national power. Ethiopia has become increasingly able to challenge the Egyptian

hydro-hegemony by an increase in *issue-specific power*, power within a single issue-area.

The analysis of changes in the balance of power between Ethiopia and Egypt in conflicts concerning rights and allocations of the Nile water is structured as follows. Section 4.1 presents Habeeb's (1988) theoretical framework. The terms aggregate structural power and issue-specific structural power will be presented and explained. Section 4.2 examines the aggregate structural power of Egypt and Ethiopia, and section 4.3 examines their issue-specific structural power. These two sections make it clear that there has been a change in the balance of power between Egypt and Ethiopia, but that this change is issue-specific rather than aggregate. Section 4.4 assesses the durability of Ethiopian power. Section 4.5 summarizes the analysis of changes in the balance of power and discusses the explanatory ability of power on Egypt's position.

4.1 The Importance of Power in International Negotiations

Power is a key concept in the study of international relations. Within this field it is common to argue that the result of a given conflict is connected to the balance of power between the actors. A question of importance is therefore: what is power really? Power is one of the most contested terms in the social sciences. A definition that might resemble a sort of least common denominator of all available definitions is that power is the ability to elicit desirable results (Petersson, 2007: 160). If power is the ability to elicit desirable results, what factors give an actor this ability? What factors constitute power? In the study of international negotiations it has traditionally been argued that the most relevant sources of power, the most important determinants of the negotiation outcome, are economic and military factors (Hopmann, 1996: 53-54). Economic and military power may be the most significant determinant of the outcome of many international negotiations. There are, however, cases where a weaker actor – in terms of military and economic power – secured a larger share of its preferred outcome than its power in these fields should permit. The classic example is the Panama Canal negotiations between the United States and Panama where

Panama secured large relative gains despite being much weaker militarily and economically than the United States. I will in this thesis argue that the conflict between Egypt and Ethiopia regarding a renegotiation of the 1929 and 1959 agreements is another good example.

William Mark Habeeb (1988) presents, as previously mentioned, a theoretical framework that is well suited to analyze and explain the outcome of asymmetric *negotiations*. Egypt and Ethiopia´s relationship concerning the Nile has for a long time been characterized by non-violent *conflict* with occasional instances of formal negotiations. Why has a theoretical framework relevant for negotiations been chosen to analyze a conflict that only periodically has been the subject of formal negotiations? The reason is, as Thomas Schelling argued, that international conflicts for all intents and purposes are international negotiation situations (Hopmann, 1996: 53). A theoretical framework for international negotiations is therefore deemed appropriate for understanding the balance of power between Egypt and Ethiopia.

Habeeb defines power as the way in which "actor A uses its resources in a process with actor B so as to bring about changes that cause preferred outcomes in its relationship with actor B" (Habeeb, 1988: 15). He does not disregard the importance of military and economic power, but instead increases the number of relevant variables. Habeeb argues that an actor's capabilities and resources concerning a specific issue compared to those of another actor are equally or perhaps even more important to the outcome of a given negotiation than the balance of military and economic power. It is the balance of power within the issue area that generally defines the outcome of a conflict within that same issue area (Habeeb, 1988: 17- 21). Habeeb´s (1988) theoretical framework therefore includes two broad sources of bargaining power. The traditional source of power is in this framework labeled *aggregate structural power*. Aggregate structural power is defined as an actor´s resources and capabilities not just in relation with the opponent, but vis-à-vis the community of states as a whole. This is useful as it gives a basic introduction to the general power-position of the states of interest (Habeeb, 1988: 17-18). Power within a specific issue is in this theoretic

framework labeled *issue-specific structural power* and is determined by three main factors or variables. These are the alternatives, control, and self-binding capabilities of the negotiating actors (Habeeb, 1988: 19-23) and they will be discussed further in the sub-chapter dealing with issue-specific power.

4.2 Aggregate Structural Power

Aggregate structural power was above defined as an actor's total resources and capabilities vis-à-vis the world as a whole. It is far beyond the scope of this thesis, however, to give a detailed presentation of all of Ethiopia´s and Egypt´s total resources and capabilities. Aggregate structural power will have to be made more manageable by focusing on a limited number of military and economic variables. These few selected variables can arguably be said to act as proxies for the broader and more complex concepts of military and economic power. There are a number of different frameworks for determining the military and economic power of a state. In order to assess Egyptian and Ethiopian military power in the period of 1990 to 2012 this thesis will use three variables selected from a military power analysis in Jordan et al. (2009) as well as from Clines "Calculus of National Power", as presented in Habeeb (1988). These variables are *Population*, *Military Spending,* and *Total Armed Forces* (Jordan et al., 2009: 273-274; Habeeb, 1988: 17). The economic power of Egypt and Ethiopia will be outlined by four other variables - *Real GDP*, *GDP per Capita*, *GDP growth*, and *Net Development Assistance and Aid*. The first three of these are readily available and commonly used to determine the size, capability and strength of an economy (Jordan et al, 2009: 248-251; Habeeb, 1988: 17). Net development assistance and aid is included because both Egypt and Ethiopia are significant recipients of such support.

Ethiopia´s and Egypt´s scores on the various variables in the period 1991-2011 are presented in figures, Figs. 4.1-4.3 for the assessment of military power and Figs. 4.4-4.7 for the assessment of economic variables. Egypt is represented by red squares and blue circles represent Ethiopia in all figures. The data used to

create these figures as well as references to where they were found are presented in Table 1 and Table 2 in Appendix 3.

4.2.1 Comparing Military Power

The variables used to determine the military power of Egypt and Ethiopia are, as previously mentioned, *population*, *military spending*, and *total armed forces*. Fig 4.1 shows that the population of the two countries has been roughly the same in the entire period of interest. Egypt is slightly ahead in the 1990s but is caught up by Ethiopia in 2005. Military spending is, on the other hand, more unequal in the period 1990-2011. Fig 4.2 shows that Ethiopia experienced quite rapid decline in its military spending in the early 1990s. This may have been caused by the fall of Major Mengistu Haile Mariam and his regime. Ethiopia does, however, experience a major spike in military spending (reaching more than 9 % of total GDP) beginning in the late 1990s and ending in the early 2000s[10]. Egyptian military spending has, according to Fig 4.2, not exceeded 5 % and has experienced a continuous decline. The numbers on this variable alone may indicate that Ethiopia therefore has a military advantage. Military spending is, however, measured as a percentage of GDP. Egypt´s GDP is significantly larger than Ethiopia´s, as shown by Figure 4.4, indicating that Egypt has spent considerably more on its armed forces throughout the period of interest regardless of percentages. The largest asymmetry in military power is, according to Fig 4.3, the total number of armed forces. Egypt has in the period 1990-2011 had several hundred thousand more troops than Ethiopia[11].

[10] The spike in Ethiopian military spending is probably due to the war with Eritrea (1998-2000).
[11] This is true even during the spike in Ethiopian total armed forces in the late 1990s. This spike was probably connected to the war against Eritrea as well.

Fig. 4.1

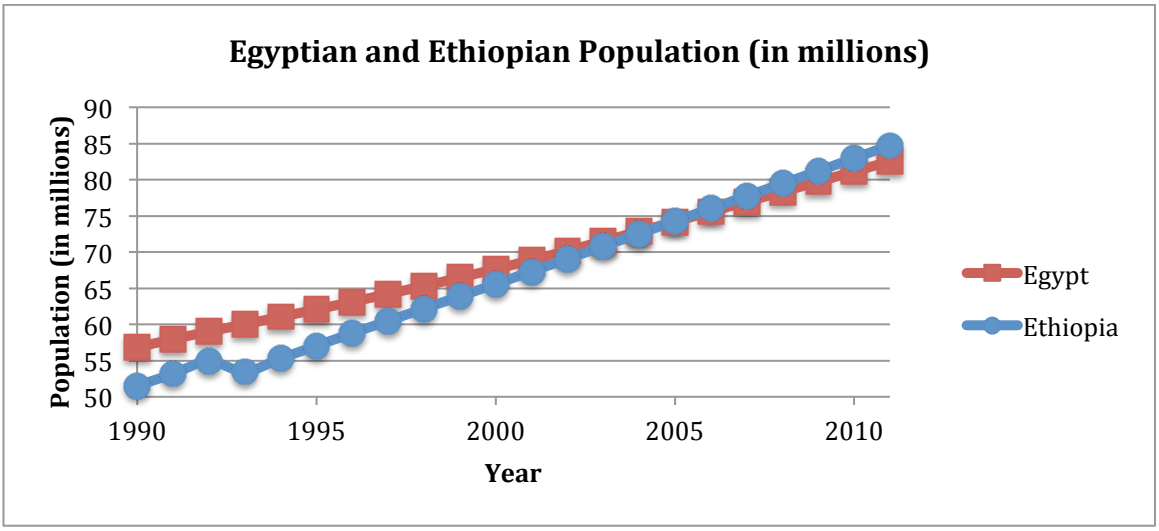


Fig. 4.2

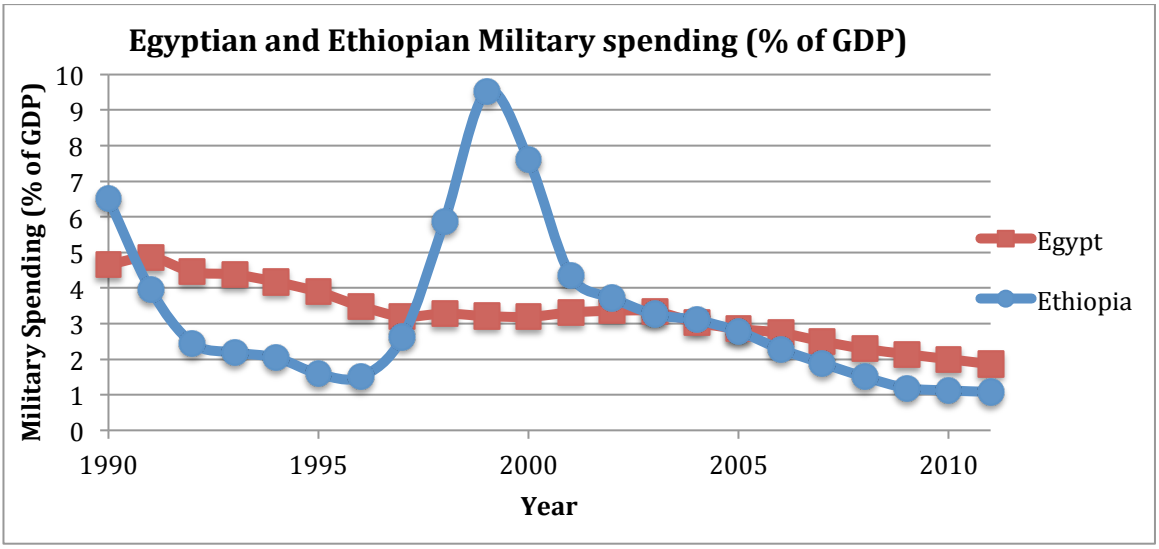
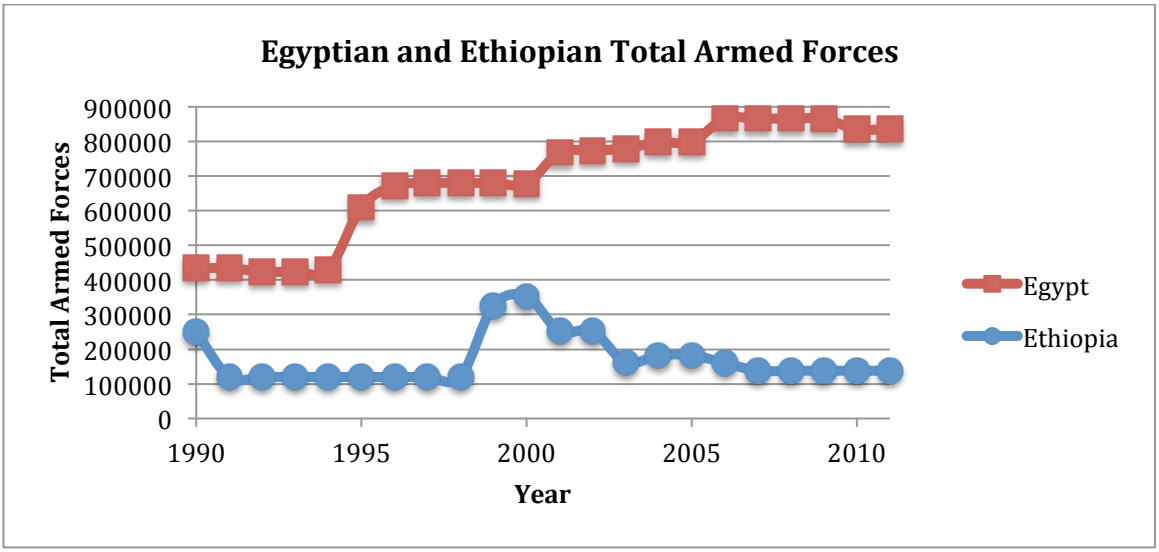


Fig. 4.3



When comparing the quality of the military forces the gap in military power grows wider. Egypt possesses considerable air power including 550 jet fighters as well as a large number of armored units including high-tech US made Abraham tanks. Ethiopia's armed forces include some 300 soviet-era tanks and a few outdated Soviet fighters (Yohannes and Yohannes, 2013: 197). When considering both the numbers and the quality of the military forces in the two states it becomes clear that Egypt throughout the period of interests has enjoyed a considerable military advantage compared to Ethiopia.

4.2.2 Comparing Economic Power

The variables selected to assess Egyptian and Ethiopian economic power are *Real GDP*, *GDP per capita, GDP growth*, and *Net development assistance and aid*. Egypt has according to Fig´s 4.4 and 4.5 enjoyed a clear advantage in both Real GDP and GDP per capita in the entire period. The Egyptian average real GDP in this period is seven times higher than that of Ethiopia. Egypt´s GDP per capita, measured in PPP$, is roughly five times higher. Ethiopia has, according to Fig 4.6 at times enjoyed higher GDP growth than Egypt. This growth has, however, suffered quite large fluctuations throughout the 1990s and into the early 2000s before apparently stabilizing. Egypt´s growth has throughout the period been much more stable. Both countries have experienced some reduction of growth since 2009, perhaps due to the global recession and financial crisis. Finally, there have been changes in the Ethiopian and Egyptian Net development assistance and aid. Fig 4.7 shows that Egypt experienced a dramatic drop in its Net development assistance and aid in 1990, which did not stabilize until 1995[12]. Egypt has since then experienced continuous reduction, although at a much slower rate. Ethiopia has, on the other hand, experienced increased Net development assistance and aid. Ethiopia actually passed Egypt in the early 2000s. The economic power of Egypt seems, based on the data in Figures 4-7, significantly greater than that of Ethiopia despite slightly lower growth and a

[12] The end of the Cold War can perhaps explain the rapid decline in Net development aid and assistance.

reduction in development assistance and aid. Based on this it seems reasonable to argue that Egypt through the period of interest enjoyed more economic power than Ethiopia.

Fig. 4.4

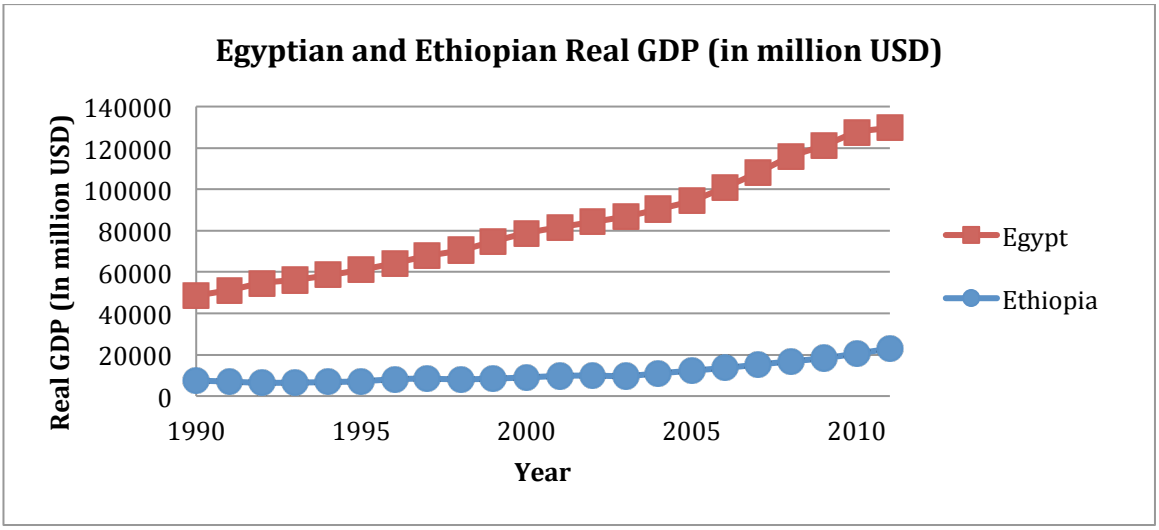


Fig. 4.5

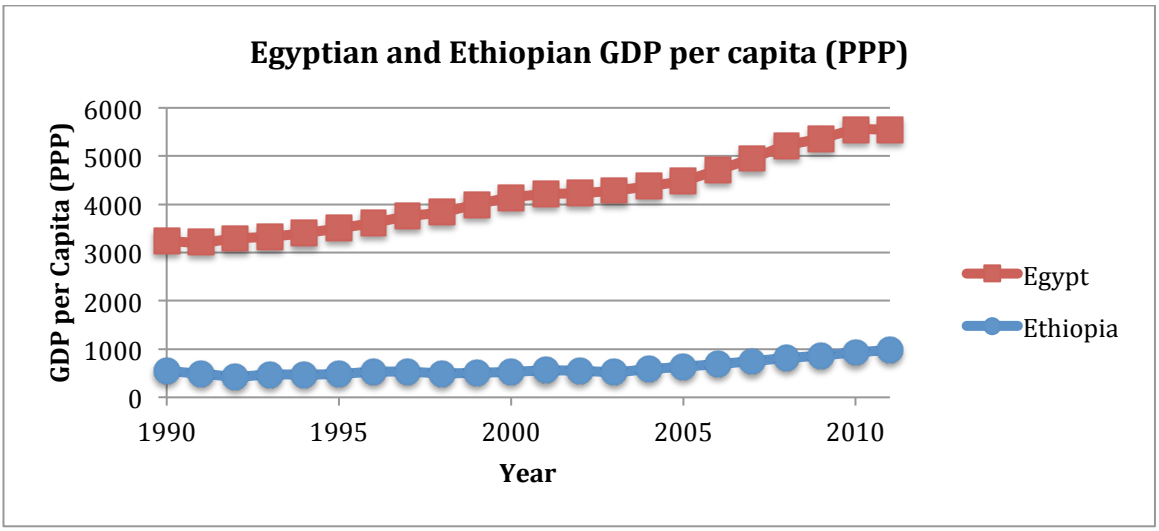


Fig. 4.6

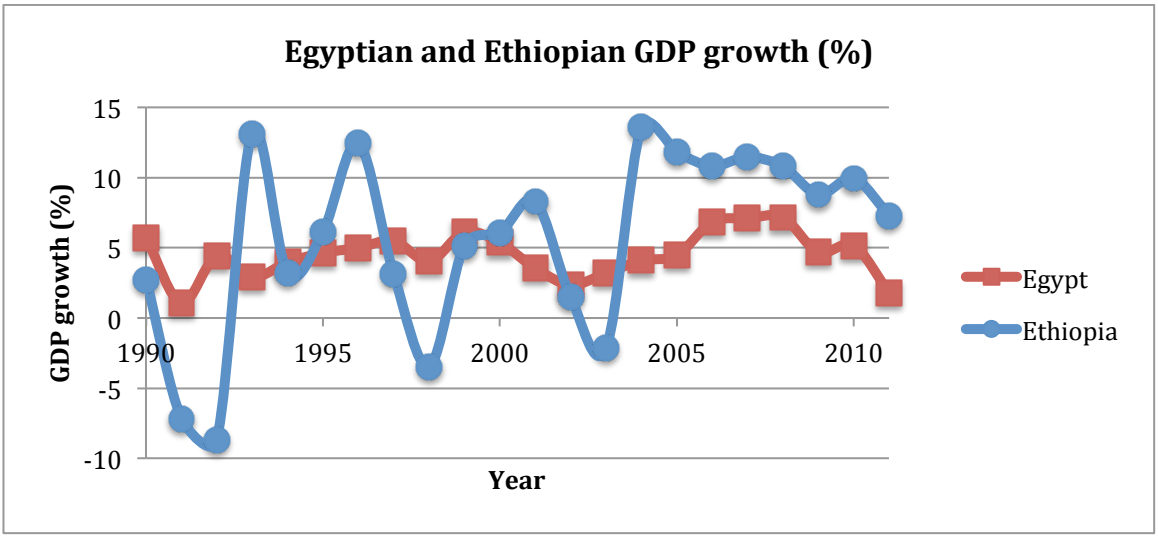
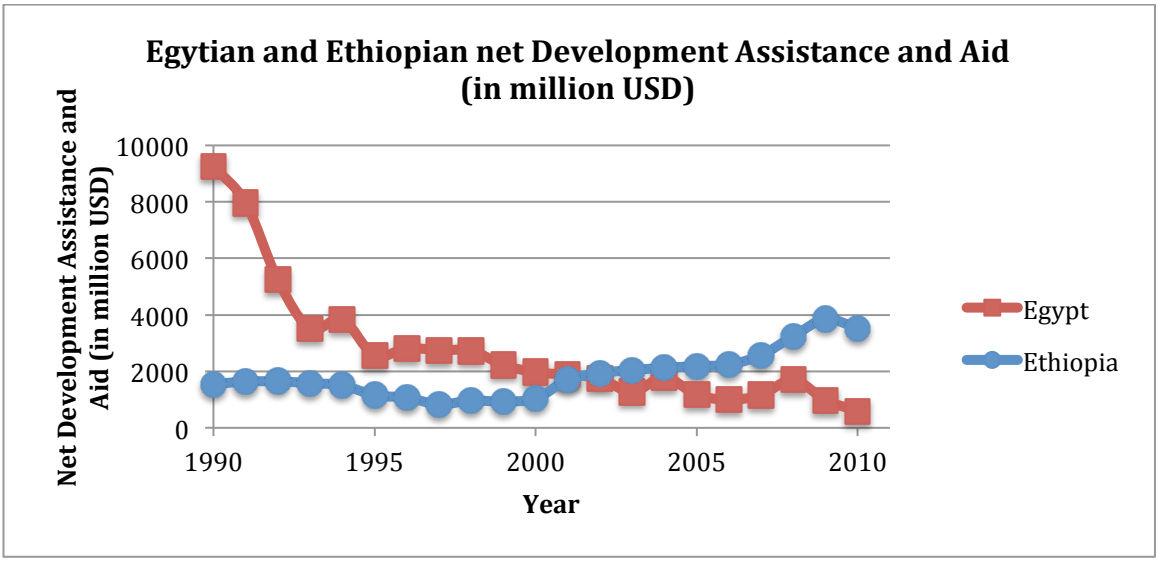


Fig. 4.7



There is, however, no available data after 2011. That means that the effects of the Arab Spring and the resulting fall of Mubarak are not included. The Arab Spring revealed severe weakness in the power apparatus of the Egyptian state. This political turmoil may have affected Egypt's ability to utilize its superior military, as well as economic power (*Tvedt, 2012: 107-108, 411; Danahar, 2013: 54-56, 101-122).* If this is the case then the asymmetry of aggregate structural power may indeed be less in 2011 and 2012 than the data in Figs. 4.1-4.7 have revealed.

4.2.3 Summary of Aggregate Structural Power

Aggregate structural power is in this thesis determined by a combination of military and economic variables. Based on this brief assessment of the balance of aggregate structural power between Egypt and Ethiopia it can quite safely be concluded that Egypt throughout the period of interest, 1990-2012, enjoyed greater economic and military power than Ethiopia. Egypt has had no reason to renegotiate the 1929 and 1959 agreements given the balance of aggregate structural power. The significant asymmetry in the balance of aggregate structural power in Egypt's favor may in fact have acted as a deterrent against upstream challenges (Jordan et al., 2009: 275). Waterbury (2002) makes this argument and claims that Egyptian deterrence contributed to maintain the Egyptian hydro-hegemony for a long time (Waterbury, 2002: 167).

4.3 Issue-Specific Structural Power

Issue-specific structural power is the term given by Habeeb (1988) to an actor´s capability and resources compared to those of another actor in terms of a *specific issue*. As previously mentioned Habeeb argues that power within an issue area is constituted by three factors – the *alternatives*, *control*, and *self-binding capability* of the negotiating actors. An actor's alternative refers to the availability of alternative arrangements to a cooperative agreement with the opponent that can improve chances of securing the preferred outcome. Control refers to the degree an actor unilaterally can achieve its preferred outcome. The final factor of importance, the self-binding capability[13], refers to the degree an actor desires or needs its preferred outcome, and therefore deals with an actor's ability to bind itself to its goal (Habeeb, 1988: 19-23). Together these factors enable an

[13] Originally labeled commitment in Habeeb´s theoretical framework. There are two primary reasons why this term has been replaced by "self-binding capability". First, the term commitment refers in the general negotiation literature to a particular negotiation tactic. This may cause some confusion to the reader. The term self-binding capability suffers no such ambiguity. Second, the term commitment as used by Habeeb is somewhat difficult to grasp. It is defined, however, as the degree to which an actor desires or needs its preferred outcome (Habeeb, 1988: 21-23). It is therefore, as a source of power, concerned with the ability of an actor to bind itself to its preferred outcome.

assessment of the issue-specific power balance, which essentially is a balance of dependency. The actor with the most issue-specific structural power is less dependent on its opponent to reach its preferred outcome, thereby enjoying an advantage in the negotiations (Habeeb, 1988: 19-23). The following pages will analyze and explain the issue-specific structural power of both Egypt and Ethiopia in the conflict regarding a renegotiation of the 1929 and 1959 agreements.

4.3.1 Alternatives

As mentioned above an actor´s alternative is connected to the availability of alternative arrangements to an agreement with the opponent that contributes to a negotiating party´s ability to secure its preferred outcome. The availability of such alternatives generally reduces an actor´s dependency on the opponent and as such strengthens the actor´s issue-specific structural power (Habeeb, 1988: 21-22; Muthoo, 2000: 154-156). It is not only the availability of alternatives in the form of alternative arrangements that improve the bargaining position of a state. Denying the opponent access to alternatives can also be a potent bargaining tool. Alternative arrangements to a negotiated agreement have been an important source of issue-specific structural power for both Egypt and Ethiopia between 1990 and 2012. Three factors are particularly important in regards to available alternatives for Egypt and Ethiopia. These are access to foreign investments and loans, basin-wide coalitions, and finally the emerging conflict between the Sudan and Egypt.

Alternatives and Access to Foreign Investments and Loans

Since the end of the Cold War there have been two major exogenous actors in the Nile basin negotiations relevant for the access to foreign investment and loans. These are the World Bank and the People´s Republic of China. While the first benefitted Egyptian interests for a long time, the second has more recently given Ethiopia opportunities that previously were unobtainable, and thus significantly reduced Ethiopian dependence on Egypt.

The World Bank was for a long time, advertently or inadvertently, among the most important external actors to Egypt in matters concerning the Nile river basin. The reason for this is that World Bank policy on loans for hydro-developments demand that no downstream state objects to the project (World Bank Operational Policy 7.5). In most of the 1990s Ethiopia could not hope to finance hydro-development projects, and particularly not projects of a larger scale, without the financial support of the World Bank or similar international financial institutions. The World Bank policy essentially gave Egypt a de facto veto power over Ethiopian hydro-development, and was an efficient means of preventing an Ethiopian challenge to the status quo stated in the 1929 and 1959 agreements[14]. This de facto veto power has arguably been a much more efficient tool than the de jure veto power Egypt claims to have based on these agreements (Tvedt, 2012: 114; Cascão, 2009: 254).

While Ethiopia was able to engage in small and micro-scale dam construction its ability to significantly affect the flow of the Nile into Egypt was very limited (Collins, 2006: 120-121). The World Bank policy, as a source of de facto veto power against upstream hydro-development, worked as long as there was no other actor able or willing to finance such developments. It was effective because Ethiopia did not have any significant alternatives. This changed dramatically with the emergence of China as an investor in Ethiopian hydro-development projects.

Since the early 2000s China and Chinese companies have invested in Ethiopian hydro-development projects. While the World Bank, as well as several bilateral donors, had been unwilling to invest in upstream hydro-developments in the Nile, China has had no such reservations. Chinese capital has helped finance micro-dams in the highlands as well as large-scale projects such as the Tekezze Dam on the Tekezze River, a tributary to the Blue Nile (Nicol and Cascão, 2011: 321). In relation to external alternatives the most significant effect of the Chinese

[14] Egypt has also been able to block loans from other financial institutions such as the African Development Bank (Kendie, 1999: 158).

presence has been to greatly reduce the impact of the Egyptian de facto veto through the World Bank. China as an alternative source of funding has enabled Ethiopia to engage in development of hydro infrastructure on the Blue Nile and other tributaries (Taylor, 2004: 276; Tvedt, 2012: 168; Cascão, 2009: 254, 260-261). The presence of China has significantly reduced Ethiopian dependence on the outcome of negotiations and therefore also Egyptian bargaining power within this issue.

Alternatives and the Establishment of Basin-Wide Coalitions

The building of coalitions has been an important source of issue-specific structural power for both Egypt and Ethiopia. Coalitions are a common element in international negotiations and can be defined as a cooperative effort, often short-range, for the attainment of issue-specific objectives (Dupont, 1994: 148). Coalitions can therefore be argued to be located between formal alliances and informal agreements when it comes to the level of cooperation and alignment they contribute to. Coalitions are generally headed by a state, which takes or is given a leadership role (Underdal, 1994: 178). Egypt strengthened its position and ability to maintain the status quo by engaging with upstream states as a leader of coalitions. Ethiopia has more recently acquired a leading position in the group of states who have ignored Egyptian objections and signed the Cooperative Framework Agreement (CFA). The significance of coalitions and the change of coalition leader from Egypt to Ethiopia are described below.

In the time period of interest Egypt has initiated coalitions in the Nile Basin, and acted as a leader within them, on several occasions. The two dominant cooperative institutions in the Nile Basin in the 1990s, Undugu (1983-1993) and its replacement TECCONILE (1992-1998), resemble coalitions given their issue-specificity. Undugu included Egypt, Sudan, Uganda, DRC, and the Central African Republic. Its successor TECCONILE included Egypt, Sudan, Rwanda, Tanzania, Uganda, and DRC.

Both Undugu and TECCONILE were established on Egyptian initiative. Ethiopia chose an observer role in Undugu and abstained from participating in TECCONILE because of the bilateral and sub-basin scope of these cooperation arrangements[15]. This means that Ethiopia excluded itself both from the process as well as from potential hydro-coalition partners who did participate (Mekonnen, 2010: 423-427; Collins, 2006: 118; Arsano and Tamrat, 2005: 19). Egypt influenced the incentives of the members of both Undugu and TECCONILE by a combination of threats and promises, a common leadership tactic (Underdal, 1994: 186). The promises included financial support to a selection of small-scale hydro-development projects. The threats were directed against any state, both members and non-members, who affected the flow of the Nile into Egypt. Egypt's superior aggregate structural power ensured that both the threats and the promises had some credibility.

Egypt was able to greatly influence the discourse within both coalitions and was powerful enough to dictate what topics were "on" the agenda and what topics were "off" it. Their primary tasks were technical cooperation between member states. Discussions concerning the legality and the validity of the status quo based on the 1929 and 1959 agreements was kept firmly off the agenda (Cascão, 2009: 248; Yohannes and Yohannes, 2013: 199; Collins, 2006: 118).

The lack of progress in establishing a permanent cooperative institution through the NBI caused four upstream states – Ethiopia, Kenya, Tanzania, and Uganda – to sign a new Nile Cooperative Framework Agreement (CFA) in 2010[16], and they were followed by Burundi in 2011. This was accomplished despite strong objections from Egypt and Sudan, the two states who significantly benefit from the status quo. The upstream states argue that the CFA of 2011 replaces the 1929 and 1959 agreements while Egypt objected and reacted with threats of violence (Warner, 2012: 182-183). For the first time the upstream water producing states joined a coalition against the traditional downstream hegemon.

[15] The even earlier cooperation institution Hydromet (1967-1972) did not even cover the Eastern Nile Basin at all (Arsano and Tamrat, 2005: 19).
[16] The upstream states were careful however not to include any allocation claims as to not further upset the downstream states (Warner, 2012: 183).

This time Egypt is on the outside and its power to dictate the agenda and influence the discourse by threats and promises is reduced considerably (Warner, 2012: 182-183; Yohannes and Yohannes, 2013: 203; Tvedt, 2012: 431; Nicol and Cascão, 2011: 322-323).

Ethiopia has arguably acted as the leader of this new coalition of riparian states. This has been possible through a combination of various factors. Unilateral action and defiance against Egyptian demands may have given Ethiopia credibility and status among the other upstream states concerning this issue. Meles Zenawi, the late Ethiopian Prime Minister, also enjoyed considerable prestige both within Africa and in the international community in general (Eidhammer, 2012: 69-70). The combination of example and a strong leadership appears to have been a powerful one. The coalition of upstream states, who all have signed the CFA, has affected the issue-specific structural power balance between Egypt and Ethiopia in several ways. It has reduced Egypt´s ability to dictate the agenda by uniting several upstream states around a common goal. The coalition, and their argument of equitable utilization, can also be argued to give upstream hydro-development additional legitimacy.

Alternatives and The Sudan

The status quo based on the 1929 and 1959 agreements has secured a de jure, and a near de facto, monopoly on water for Egypt and the Sudan for decades. These agreements have obliged the two states to have a united front vis-à-vis the upstream states. The Sudan has, however, for a long time been unhappy about the significantly asymmetrical allocation in the 1959 agreement although it has been unable to fully utilize its allocation of 18.5 billion m^3/year. There are plans in the Sudan for a large-scale increase in irrigation in order to improve agricultural yields. The realization of these plans became pressing after the independence of South Sudan. Agriculture, and particularly cash crops, has become increasingly important to diversify the economy after the independence of South Sudan and Sudan´s loss of its former major oilfields. These plans, if realized, will require water on such a scale that renders the allocation of the

1959 agreement insufficient (Nicol and Cascão, 2011: 319; Cascão, 2009: 259). The most stable dyad in the basin, the Egyptian-Sudanese alliance, is showing signs of weakness.

The fractures in this alliance is perhaps most distinguishable by the two countries reaction to the construction of the Grand Ethiopian Renaissance Dam (GERD) on the Blue Nile in Ethiopia. This will be the largest dam in African when completed. The government in Khartoum did not react with hostility to the announcement of the project, indicating that it might have been previously consulted or at least informed. Although Egypt has remained highly critical of the GERD, the Sudan appears to have gradually changed its position in the basin (Egypt Independent, July 14 2013; The Sudan Tribune, June 9 2013; Aman, September 18 2013; Amin, June 6, 2013).

There can be several reasons behind this change in Sudan´s position. Change in the balance of power in the basin may have given the relatively isolated Bashir regime in the Sudan an incentive to diversify its diplomatic investments and turn towards a potentially more powerful ally (Tronvoll, 2014, [Interview]). Another possible reason for the change in Sudan´s position comes from the fact that it makes sense based on the hydrology of the Nile. Hydrologically a dam in Ethiopia close to the Sudanese border, brings benefits including seasonal stability in water flow, reduced risk of flooding, and silt reduction to the Sudan without the cost of construction (Tvedt, 2014, [Interview]). Regardless of their reasoning, it seems like the Sudan is moving towards an acceptance of multilateral cooperation in the basin and away from the traditional status quo position stated in the 1929 and 1959 agreements. Sudan´s new position has further weakened the de facto as well as de jure position of Egypt while strengthening that of Ethiopia.

Changes in Issue-Specific Alternatives

Egypt was at the end of the cold war for all practical purposes the unchallenged hydro-hegemon of the Nile. Egyptian concerns and objections blocked World

Bank loans to Ethiopia at the time, loans that were necessary to engage in larger scale hydro-development. With access to Chinese loans from the beginning of the 2000s Ethiopia could engage in hydro-development in spite of World Bank loan policy and Egyptian objections. With upstream countries' signing of the CFA, Egypt has to a significant extent also lost the ability to influence the hydro-policy of upstream states. Ethiopia on the other hand, who chose to remain outside of Undugu and TECCONILE is now advantageously situated in this new coalition of upstream states. Finally the Sudan seems to change its position on the issue of a renegotiation, causing Egypt to lose an important ally in the Nile Basin. The combination of these factors appears to have improved Ethiopia´s bargaining position to a significant extent.

4.3.2 Control

Control is the second factor that according to Habeeb (1988) determines an actor´s issue-specific structural power. As previously mentioned the term control refers to the *degree* an actor unilaterally can secure its preferred outcome or more specifically an actor's ability to unilaterally secure a greater share of its preferred outcome than the opponent is able to (Habeeb, 1988: 22). The determinants of control vary depending on the contested issue. It can be argued that the most important sources of control in negotiations or conflicts in transnational basins are the *riparian position* and the *water utilization capability* of the negotiating actors (Lodegaard, 1992; Cascão, 2009: 247; Zeitoun and Warner, 2006: 450). The following sections assess changes in the levels of Egyptian and Ethiopian control in the Nile basin since 1990. There appear to have occurred quite significant changes, particularly due to an increase in Ethiopian water utilization capability.

Riparian Position

Zeitoun and Warner (2006) argue that the riparian position of the actors is of vital importance in negotiations concerning transnational basins. This is because control of the resource generally increases the further upstream a state is

located (Zeitoun and Warner, 2006: 450). If a river runs through the three states A, B, and C respectively this means that their control of this resource, all else equal, is A>B>C. The amount of problems associated with the management of the river is, however, arranged the opposite way A<B<C (Lodegaard, 1992: 59). Being an upstream state is therefore generally a source of power in negotiations concerning water rights and allocation. The riparian position of a state is a source of power, or more accurately potential power, that is near impossible to manipulate, as the riparian position of a state in a basin is a constant, or at least a near constant within the time frame taken by this thesis.

Ethiopia is situated upstream to Egypt and between 80-90 % of all the water that reaches Egypt through the Nile originates in Ethiopia. The combination of these two factors makes Ethiopia the hydrologically most important state in the basin[17]. (Cascão, 2009: 256; Tvedt, 2012: 380). Egypt on the other hand is downstream not only to Ethiopia, but to all the nine other states in the basin; Sudan, South Sudan, Eritrea, Uganda, Kenya, Tanzania, Burundi, Rwanda, and the Democratic Republic of the Congo (DRC). Riparian position is not, however, automatically convertible into control. Riparian position is in itself only *potential control,* and without the ability to affect the flow of the water this latent power cannot become manifest. Riparian position therefore has to been seen together with the actor's *water utilization capability*.

Water Utilization Capability

The term water utilization capability is in this thesis used to denote the ability of a state to use of its water resources in electricity production, agriculture, industry, households, and/or similar activities. This capability depends on a combination of financial, technological, and human capital as well as the degree of political stability required for channeling this capital.

[17] Sudan is also an advantageously located due to the fact that the Blue and the White Nile come together in Khartoum in the Sudan. Sudan is, however, a major "consumer" and not a major "producer" of water in the basin.

Egypt has a long tradition for relatively large-scale hydro-developments, going back to antiquity. The High Aswan Dam, completed in 1971, is the best known and most significant Egyptian hydro-development project to date (Tvedt, 2011: 101-102; Tvedt, 2012: 93-94). Egypt's significant water utilization capability continued into the 1990s. At the end of that decade Egypt began developing three major land-claiming projects: the West Delta Irrigation Project, the North Sinai Agriculture Development Project, and the Toshka Development Project. The largest and most ambitious of these projects is the Toshka Development Project in in southern Egypt. The stated goal of this project is to create a new Nile Valley in the desert to feed and employ Egypt's growing population. The project will according to some estimates create 14 million square kilometers of new agricultural land and house up to 17 million people when completed (Cascão, 2009: 249; Tvedt, 2012: 112-113; Tvedt, 2011: 179-182; Collins, 2006: 122-123). Egypt´s water utilization capability can therefore be argued to have been considerable throughout the period of interest. It can, however, be assumed that the political turmoil following the Arab Spring has decreased this capability to some extent.

Ethiopia and other upstream states have until recently had very limited water utilization capability, particularly when compared to that of Egypt. Underdevelopment, internal conflict, political instability, and financial restraints have all to varying degrees contributed to this (Cascão, 2009: 254). After the overthrow of Major Mengistu Haile Mariam the new government of Meles Zenawi and the Ethiopian People's Revolutionary Democratic Front (EPRDF) needed to consolidate its position internally and improve the troubled economy (Collins, 2006: 117; Eidhammer, 2012: 69-70; Freund, 1998: 260). The water utilization capability was so limited that the Ethiopian government initially focused on the construction of micro- and small-scale dams in rural areas for water storage. One of the main goals of the EPRDF has, however, in the entire period of interests been the macroeconomic development of Ethiopia. Development of Ethiopia´s national water resources has been seen as an important means to reach this goal (Tronvoll, 2014, [Interview]). The limited

Ethiopian hydro-development has been the result of a lack of means and not ambition.

The Ethiopian government was during the 1990s able to secure an increasing degree of political and economic stability compared to previous decades[18]. This enabled Ethiopia to engage in hydro-development in the Awash and Omo rivers, in the south of the country, marked an increase in the Ethiopian water utilization capability. The problem of access to financial support for dam construction was greatly reduced with the coming of China, and Chinese firms, as an alternative source of funding. The powerful combination of increasing political stability and Chinese financial support became apparent in 1999 when work on the Tekezze Dam on the Tekezze-Atbara River, which is a tributary to the Nile, began (Cascão, 2009: 254). The growth in Ethiopian water utilization capability continued into the 2000s, its importance becoming apparent with the announcement of the plans to construct the GERD in 2011. The construction of GERD, which for now is financed by domestic means, is testimony to the tremendous increase in Ethiopian hydro-development capability that has occurred over the last twenty years[19].

Changes in Issue-Specific Control

Ethiopia's level of issue-specific control in the Nile Basin has been subject to significant change since 1990. Ethiopia's upstream position and hydrological importance has ensured that Ethiopia has had considerable potential control over the basin since its establishment as a state. The combination of these two factors may in fact be Ethiopia´s most significant geopolitical asset. Increasing political and economic stability, and the access to Chinese capital has in the period of interest enabled Ethiopia to engage in more comprehensive hydro-development and made the considerable potential control manifest as shown by the ongoing construction of the GERD. Egypt´s initially near hegemonic issue-

[18] There was, however, in this period some lapses such as the war against Eritrea (1998-2000) as well as periods of internal unrest.
[19] There are some, however, who question Ethiopias ability to continue to finance the GERD in its entirety (Schwartzstein, 2013).

specific control in the basin is dwindling despite considerable water utilization capability as a result of increasing Ethiopian control beginning in the late 1990s.

4.3.3 Self-Binding Capability

Self-binding capability is the last determinant of issue-specific structural power in Habeeb´s (1988) theoretical framework. It is, as previously mentioned, defined as the degree to which an actor desires or needs its preferred outcome. Self-binding capability therefore deals with an actor's ability to bind itself to its goal, how far an actor is willing to go to secure its preferred outcome (Habeeb, 1988: 21-23). Self-binding capability is a source of issue-specific structural power that an actor can manipulate using commitment tactics. Commitments are actions that partially bind an actor to a given bargaining position. They are only partially binding because they may be revocable, although at considerable costs (Muthoo, 2000: 160). The form of the commitments depends on the context. In the conflict between Ethiopia and Egypt the most important form of commitments is unilateral hydro-development. How bound to their respective preferred outcomes are Egypt and Ethiopia, and are they actively increasing this?

Egyptian Self-Binding Capability

Egypt appears to be more dependent on the Nile than Ethiopia is as the vast majority of its electricity as well as water for agriculture, industry, and households come from the Nile, either directly or indirectly. This dependency is increasing, as the supply of water is more or less constant while the population is growing rapidly. Average fresh water consumption in Egypt is about 700 m^3/year, which is below the internationally recognized minimum of 1000 m^3/year [20]. If the population growth continues at the current rate the consumption is expected to fall to 500 m^3/year by the year 2025 (Tvedt, 2011: 101-105; Hefny and El-Din Amer, 2005: 43).

[20] A lower average per capita consumption of fresh water than 1000 m^3/year is defined as chronic water scarcity.

Egypt is suffering from quite severe water stress with the allocations secured by the 1929 and 1959 agreements and appears determined to increase this share. Egypt has used commitment tactics in the basin to increase its self-binding capability. Egypt´s land claiming projects are perhaps the best examples of Egyptian commitments in the period of interest. These projects will, once in full operation, demand truly tremendous amounts of water (Tvedt, 2012: 112; Tvedt, 2011: 179-182; Collins, 2006: 122-123; Zeitoun and Warner, 2006: 245). As a commitment these land claiming projects, as well as older hydro-infrastructure, signal to Ethiopia that Egypt cannot concede on its demands (Cascão, 2009: 249).

Ethiopian Self-Binding Capability

In contrast to Egypt, Ethiopian agriculture is predominantly rain fed. There is also very limited water-intensive industry, and the electrification rate is low. Furthermore, Ethiopia has other rivers and waterways, such as the Omo and Awash rivers. A growing and increasingly stable Ethiopia can, however, benefit significantly from using more of the water of the Blue Nile and other tributaries. Dams, when in place, can be used for a variety of different tasks such as electricity production, irrigation, and improved transportation to mention the most important (Kumar, Schei, Ahenkorah, Rodriguez, Devernay, Freitas, Hall, Killingtveit, and Liu, 2011: 441-445). There is a considerable and growing domestic demand in Ethiopia arguing that it should be able to use more of their water resources to develop the country, which is one of the poorest in the world. Many Ethiopians see increased use of this resource as an important element in the country´s development strategy (Tvedt, 2011: 102-105; Cascão, 2009: 254). The emergence of Ethiopian water utilization capability has enabled Ethiopia to counter Egyptian commitments with commitments of its own. Unilateral Ethiopian hydro-development signals to Egypt that Ethiopia will go at it alone rather than accept a treaty on Egyptian terms (Cascão, 2009: 256).

Changes in Issue-Specific Self-Binding Capability

Both Egypt and Ethiopia are quite capable of binding themselves to their preferred outcomes, maintaining and changing the status quo respectively, in the conflict regarding the renegotiation of the 1929 and 1959 agreements and the establishment of a new arrangement in the Nile Basin. Egypt is facing a continuously declining availability of fresh water, and argues that securing their preferred outcome is a matter of *national security*. Ethiopia on the other hand argues that its preferred outcome is vital for the *development* of the country. Both countries have connected their need to vital interests of the state, and are therefore able to quite convincingly bind themselves to their preferred outcomes. Both states are also able to increase these bindings to the preferred outcome by developing hydro-infrastructure unilaterally.

4.3.4 Summary of Issue-Specific Structural Power

There have been significant changes in the issue-specific structural power in the Nile basin since 1990. Issue-specific power is, as previously mentioned, an actor´s capability and resources compared to those of another actor in terms of a *specific issue*. In order to determine these changes this thesis has discussed changes in alternatives, control, and self-binding capability, the three constituent factors of issue-specific structural power according to Habeeb (1988).

Egypt was in the early 1990s the dominant of the two states in terms of both aggregate- and issue-specific structural power. Egypt´s de facto veto power, due to World Bank loan policy, was used to block Ethiopian access to financial support. This severely limited Ethiopia's ability to take advantage of its upstream position. Perhaps more important than Egypt's issue-specific structural power was Ethiopia's lack of it. Egypt was therefore able to exercise considerable power in the basin despite its disadvantageous downstream position. Ethiopia´s limitations in issue-specific power began to change when China became an alternative source of loans for Ethiopia in the early 2000s. Chinese capital, and increased internal political stability, greatly increased Ethiopian water

utilization capability and therefore control. Unilateral hydro-development became a possibility and dependence on Egypt was reduced as a result.

These factors in combination improved Ethiopian Best Alternative to a Negotiated Agreement (BATNA) and correspondingly weakened Egypt's. BATNA is a quite common term in the literature on international negotiations and is often used to determine if a proposed agreement should be accepted or not. If an agreement leaves an actor worse off than without an agreement, the value of the agreement is lower than the current BATNA, the agreement should not be accepted (Hopmann, 1996: 57). Egypt has traditionally enjoyed the highest BATNA concerning the Nile in the basin as the status quo, based on the 1929 and 1959 agreements secured a near monopoly on the waters of the Nile. As long as this de jure claim was backed by a de facto hegemony Egypt did not really need any new agreement, and blatantly refused any new agreement attempting to change the status quo.

Refusing to negotiate is only effective if other actors are unable to act unilaterally. The changes that have occurred in Ethiopian issue-specific structural power have significantly changed Ethiopia's BATNA. Ethiopia´s BATNA is currently unilateral hydro-development, and any potentially new agreement that severely limits or even blocks such activity is therefore not acceptable for Ethiopia. Egypt on the other hand has experienced a reduction in its BATNA. Egypt´s current alternative to an agreement is an increasingly confident Ethiopia with the ability to claim water resources regardless of both previous and current Egyptian demands. Egyptian refusal to renegotiate the 1929 and 1959 agreements is answered by upstream unilateral hydro-development (Cascão, 2009: 254; Yohannes and Yohannes, 2013: 204; Tvedt, 2012: 411-413).

In hindsight Egypt could potentially have benefitted from a renegotiation of the 1929 and 1959 agreements in the early 1990s when Ethiopia was vulnerable due to civil war and its new government inexperienced. Egypt, however, seems to have been unwilling to renegotiate at that point in time (Waterbury, 1997: 295-

296; Meredith, 2006: 386-387; Freund, 1998: 260). The changes in issue-specific structural power that have occurred since the 1990s have changed the power balance in the basin. Although Ethiopia is much weaker than Egypt in aggregate structural power the increase in issue-specific power has enabled Ethiopia to challenge the Egyptian hydro-hegemony.

4.4 The Expected Durability of Ethiopian Power

Almost equally important to the change in the balance of issue-specific power is the durability of this change. Can Egypt expect that Ethiopia's newfound power will either be redirected or even crumble due to internal or external factors? Ethiopia's newfound power is not necessarily permanent or irreversible. Problems that appear to be minor and manageable today may not be so tomorrow (Tvedt, 2014, [Interview]). The EPRDF and Meles Zenawi spent much of their first decade in government consolidating their power, and it appears that it was time well spent. There are, however, factors that may interfere with Ethiopian hydro-development policy and affect its newfound issue-specific structural power. Key factors here are the continuing conflict with Eritrea, threats from internal and external non-state actors, and severe shock in the form of drought.

The Ethiopian-Eritrean war[21] (1998-2000) resulted in 100 000 casualties and regional instability and ended in a hostile stalemate where rhetoric and proxies are the weapons. This current situation is, however, much more beneficial for Ethiopia than for Eritrea. While Ethiopia gradually has become an important actor, not only in the region but also on the continent and indeed globally, Eritrea has become increasingly isolated. Eritrea has become one of the most closed off and oppressive governments in the world and the economy is virtually in ruins. Ethiopia is now the hegemonic power on the Horn of Africa, and while Eritrea may still remain a nuisance in real terms it seems to be unable to pose a serious

[21] Not to be confused with the Eritrean war of independence (1961-1991).

challenge to the security of the Ethiopian state (Eidhammer, 2012: 69-70; Cliffe et al., 2009: 153-155).

Ethiopia's current borders are the result of imperial expansion during the same period as the European states´ so called "Scramble for Africa". This expansion has created highly heterogeneous state with a large number languages and ethno-cultural differences. A lack of any real democratization may over time increase resentment of the state and increase recruitment to various existing violent and non-violent opposition movements motivated by ethnicity/nationalism and/or religious grievances (Aalen and Tronvoll, 2009: 194; Tronvoll, 2010: 121-124, 136). In the period of interests, as well as in the immediate future, it seems likely however that the threat to state security and control will remain more of a nuisance predominately limited to the periphery of the country and not a serious threat to the state.

It is important to keep in mind, however, that the Horn of Africa is a highly unstable region where conflicts rapidly become transnational and where change can occur rapidly (Cliffe et al., 2009: 151; Dokken, 2008: 107-114; Østbø, 2010: 16). A state can for outsiders, or even insiders, appear to be stable only to collapse under sudden and severe stress as exemplified by the fall of Hosni Mubarak (Danahar, 2013: 54-55). Severe drought contributed to the fall of Haile Selassie as well as Major Mengistu Haile Mariam (Meredith, 2006:212-214, 331-343), and similar stress on state structures could potentially reveal weakness that is not currently visible.

The Ethiopian state appears to be stable. It is possible, however, that conflicts in the region, increasing internal grievances, and drought can put significant pressure on the state structures and reveal weakness. Although there is some probability that Ethiopian stability and power may be reduced, particularly in the long term, it seems more likely that Ethiopia will maintain, if not improve, its current power position in the basin (Tronvoll, 2014, [Interview]).

4.5 Can the Balance of Power Explain Egypt's Position?

Mohamed Hassanein Heikal wrote in 1978 that a challenge against the Egyptian hydro-hegemony in the Nile basin was unlikely to materialize (Heikal, 1978: 175). A few decades later this statement is contradicted by the quite considerable changes in the balance of power between Egypt and Ethiopia that occurred from 1990 to 2012. This change has, however, not occurred within the traditional power aspects of military and economic power. As shown in the discussion of aggregate structural power Egypt still enjoys a very significant advantage in these power resources or determinants of power. The changes that have enabled Ethiopia to challenge the long-lived Egyptian hydro-hegemony have occurred in the issue-specific structural power. The majority of this change seems to have occurred in the late 1990s or early 2000s. Egypt´s refusal to renegotiate the 1929 and 1959 agreements could potentially be explained by the balance of power up until this point, as Egypt was still the absolute hydro-hegemon of the basin. Any new agreement would until this point yield less than the Egyptian BATNA making a renegotiation irrational.

Once the balance of issue-specific power turned in Ethiopia's favor, however, one should expect a change in the Egyptian position and acceptance of a new agreement. This has despite formal negotiations within the NBI framework not happened. Egypt continues to demand that its "historic and natural rights" must be included in any new agreement. Meanwhile Ethiopian issue-specific structural power appears to have continued to increase resulting in a higher Ethiopian BATNA weakening the Egyptian bargaining position. Waterbury (1997) argued that Egypt´s worst-case scenario would occur if Ethiopia and the EPRDF were able to stimulate economic growth and ensure political stability to such an extent as to be able to engage in unilateral hydro-development projects without support from the international community (Waterbury, 1997: 296). The construction of the GERD, which began in 2011, is both domestically financed and will become the largest dam in Africa. This project is the manifestation of Waterbury´s worst-case scenario. The GERD is not Ethiopia´s first dam and cannot be expected to be the last. The construction of GERD is the latest clear

signal that Egyptian hydro-hegemony of the basin is severely weakened, if not lost.

What options have been available to Egypt since the balance of issue-specific structural power turned? The next analysis will assess the expected benefits and costs Egypt could hope to gain from three different courses of action given the changes in the balance of power that has occurred since the late 1990s or early 2000s.

5.0 Analysis 2: Game Theoretic Evaluation of Egyptian Options[22]

So far, this thesis has focused on assessing and explaining the degree and occurrence of change in the balance of power between Egypt and Ethiopia since 1990. Based on this analysis it is quite safe to state that significant changes in the balance of power between Egypt and Ethiopia indeed have taken place after 1990, and particularly since the late 1990s or early 2000s. These changes have enabled Ethiopia to ignore Egyptian claims to de jure monopoly based on the 1929 and 1959 agreements. Ethiopia has engaged in large-scale unilateral development of its hydro resources in the Eastern Nile Basin, as well as in other smaller watersheds. The construction of the GERD is perhaps the single most important observable result of the changes that have occurred between the two countries.

The status quo stated by the 1929 and 1959 agreements has come under pressure from an increasingly powerful and confident Ethiopia. I will in the following argue that Egypt has three possible options in this new context:

i) Maintain its current position and continue to refuse to renegotiate the 1929 and 1959 agreements.
ii) Use its advantage in aggregate structural power to pressure Ethiopia to change its hydro-policy.
iii) Agree to renegotiate the 1929 and 1959 agreements.

In order to evaluate the merits of the various options this thesis will use simple non-cooperative game-theoretic models to assess the costs and benefits of each option. Non-cooperative game theory is a branch of game theory where the players are unable to make binding commitments making the question of credibility important (Hovi, 1998: 4). This makes this form of game theory appropriate when the players are states in the international system.

[22] This chapter is based on a term paper for STV4228B-Spillmodeller og Internasjonalt Samarbeid (*Game models and international Cooperation*) at the University of Oslo, the department of Political Science (Røsberg, 2013b).

Game theory is an appropriate evaluation tool because of its ability to present strategic interaction between rational actors, or players, in a clear and logical manner. Game theory does, however, demand that some assumptions are made concerning the players. First, it is assumed that the players, Egypt and Ethiopia, are rational actors. A rational actor is able to identify and choose the option that secures the maximum payoff in relation to its preferences (Hovi, 2008: 17-18). Second, the players know that their payoff does not depend only on their own actions, but also on the actions of their opponent(s). The players in a game will therefore be concerned with what the opponent is likely to do. Third, game theory demands that assumptions are made concerning the information the players have access to. There are two primary distinctions concerning information, complete vs. incomplete information, and perfect vs. imperfect information. Complete information means that the players know their own as well as the opponent's options and preferences. Perfect information means that the players know the entire history of the game in every situation where they have to make a choice (Hovi, 2008: 30-31).

5.1 Option 1: Maintain Its Current Position and Refuse to Renegotiate the 1929 and 1959 Agreements

Egypt has in the entire period of interest stood firm against upstream attempts to develop hydro-resources in the tributaries to the Nile. Egypt continues to argue for the validity of the 1929 and 1959 agreements and has strongly opposed attempts to formally change the status quo through its refusal to accept the CFA. In particular, they argue that sub-article 14B takes away their historical rights to the Nile (Yohannes and Yohannes, 2013: 203; Hefny and El-Din Amer, 2005: 46). The combination of threats against upstream states, unilateral action to claim more water, and refusal to engage in the CFA/NBC signals that Egypt's current position is one where a renegotiation of the 1929 and 1959 agreements it out of the question (Collins, 2006: 122-123; Cascão, 2009: 249; Warner, 2012: 183; Yohannes and Yohannes, 2013: 203; Tvedt, 2012: 107-108). For the majority of Egypt´s history this position was unproblematic, as the upstream states lacked the ability to affect the flow of the river in any significant manner

(Arsano and Tamrat, 2005: 19; Cascão, 2009: 247). Given the significant changes that have occurred in the balance of issue-specific power between Ethiopia and Egypt this is no longer the case.

The geopolitical paradox on the Nile, where downstream actors have had control of the watershed, is no longer as prominent as it has been. The construction of GERD, financed for now in its entirety by Ethiopia itself, as well as smaller projects despite Egyptian protest underline that unilateral hydro-development has become a viable option for Ethiopia. Refusal to renegotiate the 1929 and 1959 agreements may reduce Egyptian water security and weaken their bargaining position, particularly in the long run. The reasoning behind this statement will be explained and presented by simple game theoretic models.

5.1.1 Externalities

Benefits from investment in hydro-infrastructure may include increased electricity output, improved irrigation potential, improved water access and quality for households, stabilized water flow, and protection from floods and droughts (Kumar et al., 2011: 477). An additional benefit of such projects may be an increase of domestic and foreign prestige[23]. As both Ethiopia and Egypt are engaged in the development of hydro-infrastructure it seems safe to assume that both states are expecting a positive gain from doing so (Cascão, 2009: 262-263).

Upstream development of hydro-resources may, however, have unintended consequences for downstream riparian states. Unintended consequences, both positive and negative, resulting from the actions of another actor are *externalities* (Barrett, 2003: 50-51). There are generally both positive and negative externalities associated with upstream development of hydro-resources. Negative externalities of upstream development may include an increase in evaporation and pollution of the river. It may also make the flow of

[23] The expected benefit of increased domestic and foreign prestige could explain the slightly megalomaniac nature of projects such as the Renaissance Dam and land claiming projects in the Toshka Depression.

the river less predictable, particularly in the period when dams are being filled up or in periods of severe drought such as that experienced on the Horn of Africa in the 1980s. Positive externalities resulting from upstream hydro-development may include silt-reduction, a more stable annual flow of the river, and a number of other positive traits.

The externalities Egypt can expect from Ethiopian hydro-development are assumed to be predominantly negative, for two primary reasons. First, Ethiopia and Egypt does not share a border but are separated by the Sudan. The majority of positive externalities resulting from Ethiopian hydro-development are predominantly enjoyed by the Sudan and not by Egypt. Second, Egypt is already protected from drought and secured a stable flow of water by the High Aswan Dam. Egypt will therefore experience few positive externalities from Ethiopian hydro-development and be left with the negative externalities. As Ethiopia is upstream it can safely be assumed that Ethiopia will not experience any hydrological externality from Egyptian hydro-development (Lodegaard, 1992: 55).

5.1.2 Mutual Hydro-Development in a Static 2x2 game

This simple two-player game is designed to present one possible consequence of increased upstream capability and the resulting negative externality. In this game, two players, Egypt and Ethiopia, must decide whether to "Develop" or "Not Develop" the freshwater resources they have access to from a shared river. In order to simplify the model, both players are assumed to be equal in all aspects apart from their position along the river. Egypt is downstream and Ethiopia is upstream. The players are assumed to have complete but imperfect information[24]. As both states are engaged in hydro-development the assumption that both players benefit from doing so is reasonable. The benefits from developing hydro-infrastructure are B (B>0). The negative externality resulting

[24] As this game is a game with simultaneous moves the players cannot have perfect information, as they do not know what the opponent has chosen until *after* they have made their own choice.

from upstream hydro-development is E (E>0). As Ethiopia is in the early stages of hydro-development on the Nile, it is assumed that B>E[25]. The four possible outcomes in this game are presented in the game matrix below. Ordinal values are presented in parenthesis to make the matrix more readable.

Fig. 5.1

Mutual hydro development in a static 2x2 game

Egypt \ Ethiopia	Develop	Not Develop
Develop	B(2) NE B-E(1)	0 (0) B(2)
Not Develop	B(2) 0-E(-1)	0 (0) 0 (0)

The matrix shows that both players benefit from choosing "Develop" rather than "Not Develop" in this game. "Develop" is a strictly dominant strategy[26] for both players. In a game where both players have a strictly dominant strategy there is only one Nash-equilibrium (NE). The NE is an outcome where no actor has a reason to regret its choice of strategy given the choice of the opponent (Barrett, 2003: 57). In games where there is only one NE this outcome is generally taken as the solution of the game. Assuming that the players are rational, they will both choose "Develop" in this particular game (Hovi, 2008: 40). This would also be true if the game is played sequentially rather than simultaneously (See Appendix 4).

This simple static game points to a particular problem. The negative externality resulting from upstream hydro-development leaves Egypt worse off than

[25] This assumption is not unreasonable as long as Ethiopia does not hold back too much water when filling reservoirs of dams.

[26] A strictly dominant strategy is a strategy that results in a higher payoff than any other strategy regardless of the strategy chosen by the opponent (Hovi, 2008: 39).

Ethiopia, and much worse off than if Ethiopia did not develop at all. How significant a problem upstream development is depends on the size of the negative externality and therefore on the scale of Ethiopian hydro-development.

5.2 Option 2: Use Advantage in Military Power to Pressure Ethiopia to Change Its Hydro-Policy.

Although the change in the balance of power between Egypt and Ethiopia has been significant, Egypt still enjoys a clear advantage in military power, in this thesis assessed by total population, military spending (% of GDP), and total armed forces. Egypt could potentially use this advantage to pressure or threaten Ethiopia to stop or moderate its hydro-development. If effective, such pressure could potentially maintain the status quo stated in the 1929 and 1959 agreements. A threat is any action signaling a conditional intention of causing harm, in some shape or form, against another actor. The intention is conditional because the harm only will be inflicted if the target fails to comply with the sender´s wishes. Although effective threats depend on several conditions the arguably most important are the threat´s credibility and severity (Hovi, 1998: 11-16). A threat that is not severe enough can be tolerated if realized and a threat that is not credible can safely be ignored. This thesis will only analyze the use of military threats because this is the form of threat most often issued by Egypt and also form of threat expected to be the most severe.

5.2.1 The Costs of Realized Military Threats

The realization of a military threat, which must be a possibility if the threat is to be credible, is associated with considerable costs. Two of the most important of these costs are arguably the *international audience costs* and *operation costs*. An assessment of both types of costs is needed to determine if an Egyptian military threat is both credible as well as severe enough.

International Audience Costs

A realized military threat may come at considerable international audience costs. In particular the use of military force may harm a country´s international prestige and important international relations (Jordan et al., 2009: 277-278). Several states in the international system have interests connected to the well being of Ethiopia as well as, directly or indirectly, its hydro-policy. China has invested quite heavily in Ethiopian hydro-development (Warner, 2012: 183) as well as in other forms of industry and infrastructure. Yohannes and Yohannes (2013) argue that a realized Egyptian military threat could be disastrous for Egyptian diplomatic ties with a large part of sub-Saharan Africa. The arguably most important actor, however, is the United States, due to its connection to both countries and international position.

Egypt´s military power has, as previously mentioned in this thesis, been highly dependent on US support since the late1970s. This support has been supplied as part of the US brokered peace agreement between Egypt and Israel[27] (Stein, 1985: 344; Meredith, 2006: 445; Danahar, 2013: 77-80; Yohannes and Yohannes, 2013: 197). Good relations with the Americans are undoubtedly important to Egyptian interests and military power. Ethiopia also has close ties to the Americans, particularly since 2001. While Egypt traditionally has been one of the most important pillars in US policy in the Middle East Ethiopia seems to have obtained somewhat of a similar role on the Horn of Africa (Holmqvist, 2014, [Interview]). Ethiopia was one of the few African states to publicly participate in the "Coalition of the willing" and has contributed to the US-led war on terror on the Horn of Africa. Ethiopia has because of its stability, in an area where this is scarce, become an important piece in US policy in the region (Jordan et al., 2009: 452-456; Adebajo, 2003: 180; Menkhaus, 2005: 23-26; Dunn, 2007: 239-243). Military action against Ethiopia in order to force change in Ethiopian hydro-policy can therefore be assumed to be against US policy and interests in the

[27] In spite of a 250% growth in US official development assistance (ODA) to Sub Saharan Africa between 2000-2005 Egypt and Israel remained the largest recipients of US bilateral aid (Jordan et al., 2009: 262).

region. Alienating the US in this matter may imply high costs for Egypt, who to a large extent depends on American financial and military support to maintain its military power.

Operation Costs

In addition to the international audience costs, Egypt will have to consider the operational costs of realizing a military threat against Ethiopia. These operational costs will depend on the scope of the realization of the threat. An Egyptian airstrike, which is a possibility due to Egypt's considerable airpower, comes at much lower operational costs than a more extensive, boots-on-the-ground, military intervention. An Egyptian airstrike, directed against Ethiopian hydro-development sites or targets of a similar nature, may hamper and delay Ethiopian hydro-development. An airstrike does not, however, necessarily ensure Egyptian water security in the long run.

Anything short of occupation of the watershed cannot guarantee to halt Ethiopian plans for hydro-development indefinitely. Such occupation would require sizable ground action or operations of a similar nature. As Ethiopia and Egypt do not share a border, operations of this magnitude can be expected to come at tremendous costs (Holmqvist, 2014, [Interview]); Yohannes and Yohannes, 2013: 197). The Sudan could have been an area from which to launch such an operation. The Sudan, however, seems to have accepted Ethiopian hydro-policy as it stands and is unlikely to side with Egypt in this matter. It is also worth mentioning that while Egypt enjoys a considerable advantage in military power, Ethiopia is the largest military power on the Horn of Africa and a considerable proportion of its soldiers have considerable combat experience (Tronvoll, 2014, [Interview]).

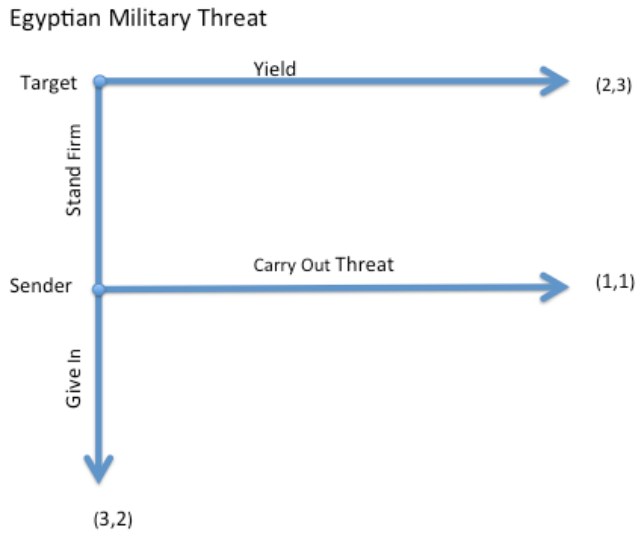
If Egypt devoted large amounts of its military as well as its political and diplomatic resources on such a venture, it could conceivably succeed, assuming that no foreign powers intervene. Given the interest several states, and particularly the United States, have in the region interference by a foreign power

is a plausible scenario. Can Egypt, given the international audience and operation costs, realistically hope to maintain the traditional status quo stated in the 1929 and 1959 agreements by threatening Ethiopia with military response?

5.2.2 Egyptian Threat Game [28]

The figure below represents a situation where a military threat has been issued from Egypt, the Sender, to Ethiopia, the Target. The game is a 2x2 sequential one-shot game, presented in extensive form. It begins with a situation where the Target must choose between two alternatives. If it chooses to "Yield" the game ends. If the Target chooses to "Stand Firm", however, the Sender has to choose between "Carry out Threat" and "Give In". In this case, the game ends after the Sender has made its choice. Both Sender and Target are rational actors and are assumed to have complete and perfect[29] information.

Fig. 5.2



The numbers in parenthesis represents the assumed degree of preference Ethiopia and Egypt has to the various outcomes in ordinal units. The preferences of the Target (Ethiopia) come first. The allocation of the preferences is determined as follows. Because of Egypt´s significant advantage in military

[28] This game is borrowed from Hovi (1998, Chapter 2).
[29] Because the game is played sequentially it is possible for the players to have perfect information. In this particular game it means that Egypt, the sender, knows what Ethiopia, the target, has chosen before making its own choice.

power it is assumed that Ethiopia would rather "Yield" (2) than have Egypt "Carry out Threat" (1), at least in the short run[30]. Ethiopia would prefer that Egypt "Give In" (3) to both of the two other options. For Egypt the best outcome is Ethiopia choosing "Yield" (3) because the game then ends without Egypt having to make further economic and political investments. If Ethiopia chooses to "Stand Firm", Egypt has a choice between "Carry out Threat" and "Give In". As previously mentioned, the realization of a military threat against Ethiopia can be assumed to imply large international audience and operation costs. It appears that Egypt is better off choosing "Give In" rather than "Carry out Threat" if Ethiopia chooses to "Stand Firm".

Which of the three possible outcomes can be expected to occur according to game theory? This can be determined using *backwards induction*, the process of reasoning backwards in time to determine the optimal options of each player (Hovi, 2008: 69). If Ethiopia chooses "Stand Firm" Egypt has two choices. Because a rational actor always attempts to maximize its payoff, Egypt will rather "Give In" than "Carry Out Threat" in this situation (2>1). Because of the assumption of complete information Ethiopia knows that Egypt´s preferences are ordered this way. Ethiopia will therefore never "Yield", as it knows that as long as it chooses "Stand Firm" Egypt will choose "Give In" (3>2). The solution of the game, given the assumption made about the situation, is therefore that Ethiopia "Stands Firm" and that Egypt "Gives In". This is the Sub-game Perfect Equilibrium (SPE) of the game[31]. The SPE the appropriate solution concept for dynamic games with complete information.

Because the Sender prefers to "Give In" when the Target "Stands Firm" it can be concluded that the military threat in this game, given the assumptions made, is not credible (Hovi, 1998: 18). As the threat is not credible, one of the conditions for effective threats made earlier in the paper, it is not likely that an Egyptian threat will be able to prevent Ethiopian hydro-development and maintain the

[30] This assumption may be false given the amount of resources Ethiopia has invested in its hydro-policy. If this is the case, the Egyptian threat would not be severe enough.
[31] We can know that the equilibrium is sub-game perfect because backwards induction leads to the SPE in a sequential game (Hovi, 2008: 69).

traditional status quo. Egypt´s advantage in military power appears to be unable to improve Egypt´s position.

5.3 Option 3: Agree to a New International Agreement Concerning Rights and Allocations of the Nile

The most likely alternative to the 1929 and 1959 agreements is the Cooperative Framework Agreement (CFA) negotiated through the Nile Basin Initiative (NBI). If the CFA is ratified a new regional cooperative regime, the Nile Basin Commission (NBC), or a similar cooperative regime, is assumed to be established. Negotiations have secured basin-wide consensus on all but one article of the CFA, article 14 (B). Egypt continues to demand that any new agreement must acknowledge previous agreements and particularly Egypt´s "historic and natural rights". The upstream states, including Ethiopia, have refused this demand and claim that its inclusion will preserve the old status quo (Yohannes and Yohannes, 2013: 203; Nicol and Cascão, 2011: 322).

Accepting the CFA and partaking in the establishment of the NBC is associated with both costs and benefits for Egypt as well as for Ethiopia[32]. A rational player will choose not to participate in an international regime when the costs of doing so exceed the expected benefits. What are the potential benefits and expenses Egypt and Ethiopia may expect from joining such a cooperative regime?

5.3.1 Costs and Benefits from Cooperation

For Egypt the benefit of cooperation could result in a reduction in the negative externality resulting from upstream hydro-development. The CFA is based on the twin pillars of "Equitable Utilization" and "Cause no significant harm" (Cascão, 2009: 247; Hefny and El-Din Amer, 2005: 46; Mekonnen, 2010: 436; Gleick, 1993: 106). Upstream development within this cooperative framework

[32] Ethiopia has in fact already signed and ratified the CFA (Tvedt, 2012: 431; Cascão, 2009: 247). This may, however, have been done because Ethiopia does not expect Egypt to accept the CFA as it currently stands.

could therefore give Egypt some influence in the shape, form, and location of upstream projects, thereby reducing negative externality compared to a situation where Egypt has little influence over such projects. There are also some indications that cooperation in the Nile basin potentially could improve the management of the river resulting in more efficient use of the resource (Yohannes and Yohannes, 2013: 200). Egyptian costs will inn all likelihood include conceding parts of rights and allocations claimed in the 1929 and 1959 agreements. As Ethiopia is currently able to ignore such claims, particularly expressed by the construction GERD despite Egyptian protests, the real cost of such a concession may not be very significant.

Given that the balance of issue-specific structural power has changed in Ethiopia´s favor, why should they accept to cooperate? While Ethiopia is currently able to challenge Egyptian claims, there are potential benefits to be had from cooperation. While the conflict between Egypt and Ethiopia is unlikely to escalate into war, its continuation is potentially harmful to Ethiopian interests. There are several examples of covert and open Egyptian support to both internal and external enemies of the Ethiopian state. Cooperation with Egypt could reduce Egyptian attempts to destabilize Ethiopia. Another potential Ethiopian gain from cooperation is economic. Egypt has, as previously mentioned, been able to prevent Ethiopian loans for hydro-development from the World Bank as well as from the African Development Bank (Kendie, 1999: 158). Although Ethiopia has access to Chinese finances, access to other sources of loans could be beneficial. Finally, given that cooperation ensures at least moderate Ethiopian de jure access to the resources of the Nile, cooperation can secure Ethiopian water security and resources even if the balance of power in the future happens not to be in their favor to the same extent as it currently is. Ethiopian costs will probably include accepting some level of Egyptian influence in upstream hydro-development resulting in some reduction in their freedom of action.

5.3.2 Cooperation in a Static 2x2 Game

In this game of complete information the two players, Egypt and Ethiopia, are assumed to be developing their hydro-resources. The benefit from doing so is given by B, assumed to be the same for both players. The players have to choose between "Cooperate" and "Not Cooperate". "Not Cooperate" implies the continuation of the current situation with unilateral hydro-development and conflict. "Cooperate" implies ratification of the CFA and participation in the NBC.

To simplify the model it is assumed that both players have equal expected gains and costs from cooperating, given by G (G>0) and C (C>0) respectively. There is, however, one exception. If Ethiopia chooses "Cooperate" Egypt experiences less negative externality than if Ethiopia chooses "Not Cooperate". The reason for this is that Ethiopian cooperation implies some moderation in the hydro-policy. E* gives the externality experienced by Egypt if Ethiopia cooperates. If Ethiopia chooses "Not Cooperate" Egypt is assumed to experience the full externality given by E. The matrix below presents the four possible outcomes of this game. Ordinal values are in parenthesis to simplify reading.

Fig. 5.3

Cooperation in a static 2x2 game

Egypt \ Ethiopia	Cooperate	Not Cooperate
Cooperate	B+G-C(3) PO B+G-C-E*(3)	B+G (4) PO B-C-E(1)
Not Cooperate	B-C (1) PO B+G-E*(4)	B (2) NE B-E (2)

Both players, Egypt and Ethiopia, have "Not Cooperate" as their strictly dominant strategy in this one-shot game. The NE of this game is therefore that both players

choose "Not Cooperate" and because there is only one NE this is taken to be the solution of the game. This would also be the outcome of the situation if the game had sequential rather than simultaneous moves (See Appendix 5). This outcome is not, however, Pareto-efficient; both players could be better off if they mutually choose to cooperate. The game has the form of a Dilemma Game (Barrett, 2003:55). Cooperation is impossible to ensure in static dilemma games without external enforcement. It is, however, possible to achieve cooperation in a Dilemma Game if it is repeated an infinite number of times because this enables enforcement by the players themselves[33].

5.3.3 Cooperation in an Infinitely Repeated Dilemma Game

To enable cooperation in a repeated Dilemma game there has to be some form of enforcement as both actors have an incentive to free ride. To simplify the model it is assumed that the only way the players can enforce the agreement is through issue-specific reciprocity. Non-cooperation in a given period is answered by non-cooperation by the opponent in the following period. Enforcement in a dilemma game is therefore only possible if the game is repeated an infinite or indefinite number of times[34], as this enables reciprocity. A repeated game is a series of repetitions of a constituent game. In our case the constituent game is identical to the static 2x2 game presented in Fig. 5.3. An agreement is arguably self-enforcing if the strategy it prescribes constitutes a sub-game perfect equilibrium (SPE) (Hovi, 2008: 81).

One commonly used enforcement mechanism, which may result in a SPE, is the Grim Trigger strategy. This strategy implies that both players pledge to "Cooperate" unless one or both players plays "Not Cooperate" in any period. If this happens, the treaty is cancelled and the players play Not Cooperate for all remaining periods of the game (Barrett, 2003: 176). Assume that any deviation

[33] Many argue that because of the ultimately anarchic nature of the international community of states any agreement must ultimately depend on being enforced by the players themselves. The agreement must be self-enforcing. (Grundig et al., 2012: 522).
[34] This means that for every competed round there is a positive chance that the game will continue for at least another round (Hovi, 2008: 82).

from the agreement will be detected immediately. This assumption is quite reasonable as the development of hydro-infrastructure is costly in resources as well as in time and result in quite visible and permanent structures.

Will the players prefer to Cooperate in all periods of the game or will one of them have an incentive to break the agreement despite the enforcement mechanism? Are the short-term gains of breaking the agreement more tempting than the long-term gains of cooperation? Given the assumption of complete information both players know their expected payoffs in all periods of the game. What are the two actors expected gains from following the Grim Trigger strategy and what could they gain from breaking the agreement?

Rational actors are generally assumed to value gains and costs in the future less than in the present. Assume therefore that the players discount future payoffs using a joint discount factor of w (1>w>0) (Hovi, 2008: 78-79). If both players follow the agreed strategy the expected payoff for Egypt is:

$U_{Eg}(H{:}H) = \frac{B+G-C-E^*}{1-w}$

If Egypt is to break the agreement than its expected payoff is:

$U_{Eg}(B{:}H) = B + G - E^* + \frac{w(B-E)}{1-w}$

The minimum required discount factor for Egypt to prefer to cooperate is determined by the following calculation:

(1) $\frac{B+G-C-E^*}{1-w} \geq B + G - E^* + \frac{w(B-E)}{1-w}$

(2) $B + G - C - E^* \geq B - wB + G - wG - E^* + wE^* + wB - wE$

(3) $-C \geq -wG + wE^* - wE$

(4) $w(G - E^* + E) \geq C$

(5) $w \geq \frac{C}{G-E^*+E}$

The equation above calculates the minimum discount factor that still enables cooperation in a dilemma game enforced with Grim Trigger. See chapter 7 in

Hovi (2008) for a through explanation of the logic behind the calculations. This minimum required discount factor increases with an increase in the costs of cooperation, given by C, and with an increase in externality experienced when cooperating, given by E*. The minimum required discount factor decreases, however, with an increase in the gains from cooperation, given by G, and with an increase in externality experienced outside cooperation, given by E. A self-enforcing agreement concerning the Nile basin is in other words more likely to endure if the gains from cooperating are high and that the difference between the externality Egypt experiences with and without cooperation is high.

If the discount factor for both actors is high enough in this infinitely repeated game mutual cooperation becomes a sub-game perfect equilibrium[35]. It is a best response against itself as long as both parties keep to the agreement, as well as after a violation has taken place. This means that it is possible to secure lasting and mutually beneficial cooperation between Egypt and Ethiopia on the issue of the Nile, given the assumption made here. This is not surprising as the vast majority of conflicts regarding shared basins are solved through cooperation (Wolf, 1998: 253-258). The Senegal River Basin Development Authority and the International Boundary and Water Commission (IBWC) are examples (Kliot, 2000: 212-213).

5.4 Evaluating the Alternatives

The previous pages have assessed the merits of three options available to Egypt given the changes in the balance of power that have occurred between Egypt and Ethiopia. Out of these three options the third, a renegotiation of the 1929 and 1959 agreements, appears to be the best alternative. Option 1, maintaining the current position and refusing to renegotiate, is the option that Egypt has held and continues to hold. The continuation of this position after the balance of issue-specific power has changed seems to damage Egyptian water interests in

[35] It is not, however, a renegotiation proof equilibrium because the punishment entails a reversal to a sub-optimal state (Hovi, 2008: 86). It is possible, however, to design a renegotiation-proof equilibrium but the method of doing so is somewhat more complex and outside the scope of this thesis.

the long term, as Ethiopia is able to ignore the status quo stated in previous agreements and is not bound by a new one. Egypt's bargaining position is weakened by each new Ethiopian hydro-development project, of which the GERD is the newest and most significant. The negative externality resulting from these projects may also be damaging to Egyptian hydro-interests in the long term. Ardent defense of the traditional status quo in the basin seems like a problematic course of action, as long as Egypt does not have the power to maintain it or Ethiopia has the capability to ignore it.

In this situation, Egypt could potentially use its advantage in military power to pressure Ethiopia to stop or moderate it´s hydro-development - Option 2. This option is associated with significant international audience and operation costs of this option, particularly if it is aimed at preventing Ethiopian hydro-development in the long term. The realization of such a threat appears to be too costly, meaning that the threat is not credible. This may explain why Egypt has not realized any of its threats against upstream states in general and Ethiopia in particular.

Options 1 and 2 are both associated with considerable problems, which leaves Egypt with Option 3. Egypt can accept the CFA and contribute to the establishment of the NBC. Egypt might expect considerable gains including a reduction in the negative externality from doing so. Choosing option 3 will, however, demand making concessions on the rights and allocations secured in the 1929 and 1959 agreements. As these rights are already ignored by Ethiopia, this seems like a low price. The question of why Egypt continues to refuse to renegotiate the old status quo after the regional hegemony maintaining it is lost still remains.

6.0 Analysis 3: Egyptian Position the Result of Internal Factors

This thesis has so far presented two analyses in an attempt to explain why Egypt continues to refuse to make concessions to Ethiopia in the conflict regarding a renegotiation of the 1929 and 1959 agreements. The first analysis assessed the presence and degree of changes in the balance of power between Ethiopia and Egypt since the 1990s. That Egypt remained the hydro-hegemon until the late 1990s or the early 2000s can possibly explain Egyptian refusal to renegotiate until this point in time. The second analysis discussed some of the problems and merits of possible Egyptian options given the changes in the balance of power that have occurred, particularly since the beginning of the new millennium. A renegotiation of the 1929 and 1959 agreements seemed to be the better of the three options. Based on these two analyses one could expect Egypt to cooperate and engage in a renegotiation as this secures the highest expected payoff over time. And yet, Egypt continues to work to maintain the old status quo based on the 1929 and 1959 agreements and refuses to renegotiate. Does the fact that Egypt acts contrary to the recommended alternative imply that Egypt is behaving irrationally?

To conclude that Egyptian non-cooperation is irrational before other explanations have been examined would be a great fallacy. There is a distinct possibility that the models and theories used this far are unable to capture the reasons behind Egyptian refusal to cooperate, particularly after the balance of power has changed in Ethiopia´s favor, because they as models and theories are simplifications of the real world (Hellevik, 2007: 173). The assumption that the state is a unitary rational actor is arguably the most significant simplification used in both of the previous analyses. While this assumption is helpful in many situations, as it reduces the amount of information needed and may even produce results on which it is possible to make generalizations, it may in this particular case exclude some important explanatory factors (Hovi, 2008: 22-23; Barrett, 2003: 54; Allison, 1969: 716). It may be possible to explain Egypt´s position and ardent defense of the historic status quo based on the 1929 and

1959 agreements when this simplifying assumption is loosened up and domestic factors are included in the analysis.

6.1 Egyptian Position the Result of Two-Level Game Dynamic

Robert Putnam (1988) argues that a government's position in a particular international conflict or negotiation is determined by domestic politics as well as international relations. This interconnection between the domestic and the international can, according to Putnam, be fruitfully visualized as a *two-level game*. Level 2 negotiations are intra-national where various groups of the domestic audience, such as social classes, interest groups, and political parties, give support to politicians who can satisfy their interests and preferences. Level 1 negotiations are international and take place between states and negotiators where states seek to maximize their ability to satisfy the preferences of the domestic audience as well as minimizing negative consequences of foreign development (Putnam, 1988: 432-434). An agreement at Level 1 must be accepted by a minimum proportion of the Level 2 audience for it to be accepted by the state as a whole. The range of Level 1 agreements that can be accepted domestically is what Putnam labels the *win-set* (Putnam, 1988: 437). All states engaged in a given negotiation will have a win-set of a particular breadth or size. If an agreement is to be reached there must be some overlap between the win-sets of all the negotiating parties involved, like in a Venn diagram. Without such an overlap an agreement is, according to Putnam (1988) impossible to reach and the situation ends in a deadlock (Putnam, 1988: 440-441).

How is the two-level game relevant for explaining Egypt´s position of non-cooperation? Shimon Peres, former prime minister and current president of Israel, has stated that the main difficulty of any international negotiation is not convincing the opponent but rather convincing your own domestic audience (Danahar, 2013: 154) and Putnam´s depiction of negotiations as two-level games captures this characteristic of international relations. The model emphasizes the fact that a state has to be mindful of two "playing fields" at the same time when conducting international policy. Moves that appear to be rational on the

international level, Level 1, may in some cases be highly impolitic and irrational at the domestic level, level 2, and vice-versa (Putnam, 1988: 434). This combined with the fact that all governments, even autocratic ones, are aware that their political survival depends on their ability to satisfy the expectations and preferences of the domestic audience to some minimal extent, may contribute to explain the Egyptian refusal to accept a new agreement. Even if the political leadership would prefer an agreement given the circumstances, it has to consider how a given policy will be received domestically and how much political capital it is willing to invest in this agreement (Hovi, Sprinz and Underdal, 2009: 25). As it can be assumed that the Egyptian position to some extent is rooted in public opinion it may be the case that it is impossible for the government to have any other position on the issue of renegotiation than it has, regardless of its actual preferences.

Egypt´s position can potentially be explained by the domestic political costs of acting otherwise. To determine the possible explanatory power of internal factors the following pages are dedicated to the assessment of the Egyptian win-set regarding a renegotiation of the 1929 and 1959 agreements. If the size of this win-set is narrow this may explain the Egyptian refusal to renegotiate.

6.2. Determining the Egyptian Win-Set

The win-set on a particular issue is determined by the power and preferences of the Level 2 audience (Putnam, 1988: 442). In order to determine the size of a particular win-set one therefore has to identify who the audience are, their power, and their respective preferences connected to the particular issue. It is far beyond the scope of this thesis to identify all Egyptian domestic groups and their respective preferences associated with renegotiation of rights and allocations. By focusing on the major socio-political groups in Egypt and a few broad preferences/interests it may still be possible to assess the size of the win-set to a satisfactory degree.

Danahar (2013) argues that there are three major social groups of particular importance in Egypt. *The Army* and *the Muslim Brotherhood* have been important actors in Egypt since the early 1950s. The Arab spring has empowered, or once again underlined the potential power of, the *people* - the third social group[36] (Danahar, 2013: 64-65, 124). All three of the major social political groups in Egypt appear to have significant interests in the maintenance of the status quo based on the 1929 and 1959 agreements (Warner, 2012: 185; Hefny and El-Din Amer, 2005: 42; Tvedt, 2012: 87). While there has been considerable conflict between, as well as within, the major political groups in Egypt it seems that they are quite united in their position on the issues regarding renegotiation of the status quo. It appears that a considerable proportion of the Egyptian domestic audience share a perception of the Nile as an Egyptian river and upstream hydro-development as a potentially major problem (Tvedt, 2014, [Interview]). Because of the large degree of national unity regarding the position it may be appropriate to treat the domestic audience as a single social entity for analytical purposes.

Three broad issues connected to the Nile are repeatedly mentioned in the literature as enduring areas of Egyptian concern. These concerns are *security*, the *economy*, and *nationalism/socio-cultural importance*. It can be argued that these concerns are interconnected to varying degrees. One general example of this is the economy, while often considered a national interest in its own right, at the same time is an element in the overall security of a state (Jordan, 2009: 247). Whether or not these preferences and interests are interconnected to a significant extent, or indeed perceived to be so, they will in the following part of the paper be treated separately for analytical purposes.

6.2.1 Security

Issues concerning the Nile are often framed as matters of national security in Egypt. Former President Mursi stated to supporters in 2012, "If a single drop of

[36] The power of the regular Egyptian is, however, nothing new as Nasser based much of his power on support from regular Egyptians and particularly the urban poor (Meredith, 2006: 42-43; Lapidus, 2002: 523-524). Increasingly ignored by his successors until the Arab Spring.

the Nile is lost, our blood will be the alternative. We will never allow anyone to threaten our security". This was an echo of statements made by previous Egyptian presidents. There are several different explanations as to why the issue of water is framed as a security issue by the Egyptian state. Some argue that Egypt actually is facing potentially severe threats from uncontrolled upstream development (Hefny and El-Din Amer, 2005). Others argue that the Egyptian narrative of threat at least in part is used to promote Egyptian interest and delay upstream hydro-development (Cascão, 2009: 248; Mekonnen, 2010: 442). Finally there are those who argue that the Egyptian narrative of upstream hydrological threats is a political diversion and a means of control of the Egyptian population (Stucki, 2005: 66; Cook, 2007; Dorman, 2007). The Nile question as a security issue appears to resonate with the population regardless of the motive behind framing it this way. Many Egyptians perceive upstream strength and the challenge to the traditional status quo as a threat despite upstream assurances of benign intentions. Whether or not this is objectively true is less relevant in this case. An important part of security issues is the psychological aspect, the perception of insecurity (Snow, 2010: 47). It is the perception of the threat that is the paramount factor.

The perception of a strong Ethiopia as a significant hydrological threat to Egypt has long historical roots. It can be argued that the security issue originated with Ethiopian threats to divert the Nile in the 14th century (Warner, 2012: 177; Kendie, 1999: 145). The British also perceived upstream control of the Nile as a threat not only to Egypt, but also to the control over Suez, access to India and ultimately the empire. The fear that the water could be stopped upstream created an incentive to secure British control over the Nile basin and large parts of East Africa. The view that upstream power constituted a threat to Egyptian water security is one of the main factors used by historians to explain why Britain risked war with France over the control of Fashoda[37] and why Britain were very concerned with the Italian occupation of Abyssinia/Ethiopia (Pakenham, 1991: 341, 429, 456, 516; Jeal, 2011: 357, 376, 387; Tvedt, 2011: 106). This long historic tradition of viewing Ethiopia as a potential threat to

[37] This is now Kodok in South Sudan (Tvedt, 2011: 111).

Egyptian hydrological interests and perhaps even survival appears to have continued into the present. Numerous threats against potential upstream hydro-development as well as attempts to destabilize Ethiopia and its surroundings are in part testament to the perceived severity of the security issue (Kendie, 1999: 154).

It therefore seems quite reasonable to argue that a significant proportion of Egyptians view upstream hydro-development and ambitions as a severe threat against the Egyptian state and people. This perception appears to be both strong and enduring to the extent where any Egyptian government has to guarantee that the Nile is not threatened (Heikal, 1978: 715; Cascão, 2009: 248).

6.2.2 Economy

Freshwater is highly important to any economy as it is used in agriculture, energy production, industry, and in households. Because nearly all water in Egypt comes from the Nile the economy depends on this source of freshwater. If Egypt wishes to increase agricultural and industrial output and improve living conditions more water is needed, and the most readily available source is the Nile[38] (Kim and Glaumann, 2012: 6). With the current Egyptian per person freshwater consumption of approximately 770 m^3/year, the limitation in available freshwater resources appears to be one of the most significant long-term challenges of the Egyptian economy (El-Sadek, 2009: 2438; Kendie, 1999: 144). It is impossible within the scope of this thesis to determine all the economic interests Egyptians have associated with the allocations stated in the 1929 and 1959 agreements. The following pages will therefore use the agricultural sector as an example of the economic importance of the Nile for Egypt and the difficulties of accepting a new agreement.

[38] Some claim that Egypt already uses more water than it has claim to according to the 1929 and 1959 agreements. This is possible because the Sudan so far has been unable to utilize the total amount of its share (Cascão, 2009: 247; Nicol and Cascão, 2011: 319).

The agricultural sector is the most water-demanding sector of the Egyptian economy, and is therefore most vulnerable to a new water situation. Egyptian agriculture uses about 85% of the available water; ten times more water than the industrial and municipal sectors combined (El-Sadek, 2009: 2438-2440; Allam and Allam, 2007: 208). Egypt´s agricultural sector is also a major source of employment and livelihood employing about 30% of the working population (Shakwer and Youssef, 2007: 25). A reduction, or even long-term stagnation, in available freshwater resources can be expected to have a significant impact on the lives of Egyptians, and not just those who find employment in the agricultural sector. A reduction in available freshwater can result in lower agricultural yields causing an increase in food-prices, which can have serious implications for a significant proportion of the Egyptian population (Holmqvist, 2014, [Interview]).

In order to handle this problem the "Water Resources Strategy of Egypt Until 2017", drafted by the Egyptian Ministry of Water Resources and Irrigation (MWRI) in 1997, recommends that Egypt should work with upstream states in order to *increase* its quota from the Nile. Given the changes in power that have occurred since 1997 this goal appears to be highly optimistic at best (Allam and Allam, 2007: 206-207; El-Sadek, 2009: 2447). There are other, and perhaps more suitable, alternatives available to Egyptian policy makers. One possible action is to *increase efficiency* of the use and re-use of available water. Increased efficiency of the water usage in the agricultural sector and perhaps even a reduction in this sector through the establishment of alternative employment can reduce Egypt's water needs. A second possible action is to increase the *import of virtual water* in the form of imported industrial and agricultural products. The value of virtual water is determined by the amount of water that would have been consumed domestically if an imported product were produced domestically (Renault, 2008: iv). The import of virtual water, particularly in the form of agricultural products, is already an important secondary source of fresh-water in Egypt (El-Sadek, 2009: 2437). Improving the efficiency of the water usage and importing virtual water in the form of agricultural products are two of several ways Egypt can improve the domestic water availability while at the same time accepting a new

status quo. Implementing these partial solutions is, however, associated with considerable economic as well as political costs.

Increasing the efficiency of water usage in Egypt requires substantial investments in infrastructure and management. While there are several means to finance such an endeavor a cut in agricultural subsidies, which secure free water to farmers, may be the most suitable. Taking money for water is, however, a potentially highly unpopular policy as many Egyptians consider water a basic human right and a good that, according to Islamic law, cannot be sold. Making cuts in agricultural subsidies seems to be associated with a considerable political cost (Shakweer and Youssef, 2007: 25-29). Egypt imports, as previously mentioned, a significant amount of virtual water, primarily in the form of imported agricultural products (El-Sadek, 2009: 2437; Warner, 2012: 180). To import even more as a partial solution to the problem of limited freshwater resources is not, however, without problems. One important problem associated with the import of virtual water in the form of food is that many Egyptians perceive this import leading to increasing dependence on foreign powers. While an increase in import of virtual water may contribute to reduce the effect of scarce freshwater resources there is a perception among many that this may lead to a threat to the national food security and dependence on other states (El-Sadek, 2009: 2447). While the economic interests of the Level 2 actors in Egypt can be reduced, the means of doing so are costly and expected to be highly unpopular.

The Egyptian national economy as well as the personal economy of many regular Egyptians is dependent on waters from the Nile. A renegotiation of the 1929 and 1959 agreements can lead to a reduction in the current quota. While it is possible to do more with less through increased water efficiency in the agricultural sector and import of virtual water these come with substantial economic and political costs of their own. Making concessions on the current de jure quota can be expected to be very unpopular among many Egyptians.

6.2.3 Socio-Cultural Importance

Finally it can be argued that the Nile is important to Egypt and Egyptians for reasons beyond its material or instrumental usefulness. The Nile is important to Egyptians for historical, cultural, economic, and security reasons. It is, however, perhaps more important than the sum of these elements. Waterbury (1997) seems to agree and states that there is no issue that arouses popular fervor in Egypt to the same extent as the question of water (Waterbury, 1997: 295).

Egypt is a country that is sharply defined by both history and geography, perhaps more so than any other country in the region. There are traces of a continuous Egyptian identity going back centuries if not millennia. The modern Egyptian nation-state is based on this historic existence of an Egyptian people and an Egyptian state (Lewis, 1995: 328-329; Lapidus, 2002: 518-519). The Nile has been central to the success and prosperity of the Egyptian state since it began and continues to be so. The Nile has with time become an embedded national-cultural issue. The 1929 and 1959 agreements contributed to the continuation of Egyptian control over the Nile and preserve the historic status quo (Cascão, 2009: 248). In this period, which only recently can be argued to have ended or come nearer an end, the inherently asymmetric water allocation has for many Egyptians come close to be equated with the natural order of things (Tvedt, 2011: 104). Egypt has in the entire period of interests stressed that any new agreement must preserve the "natural and historic rights" that Egypt has to the Nile. The hydrological ambitions of the upstream states are by some perceived to be near theft (Mekonnen, 2012: 440).

In most cases negotiations demand that all participating actors make some concessions. While making concessions on material or instrumental values can be difficult enough, there are certain values that appear near impossible to negotiate as they are, or ought to be, absolute and inviolable. Atran and Axelrod (2008) use the concept of *sacred values* in such cases to differentiate between material values and values that are absolute. While sacred values in many cases are connected to religious faith this is not always the case. Sacred values can also

be associated with personal or national identity (Atran and Axelrod, 2008: 221-230). It seems like a significant proportion of the Egyptian domestic audience, Level 2, perceives control over the Nile as a sacred value, or at least a value of similar importance. This means that a renegotiation of the 1929 and 1959 agreements can be assumed to come with a high political cost despite the reasoning for accepting a new agreement.

6.2.4 The Egyptian Win-Set and the Plausibility of Overlap

A country´s win-set or the range of Level 1 agreements that can be accepted domestically is as previously mentioned determined by the power and preferences of the Level 2 audience (Putnam, 1988: 437-442). It seems like a substantial part of the Egyptian domestic audience perceives Ethiopian hydro-development as a threat to national security, damaging to the national economy, and possibly theft of a river that historically and naturally belongs to Egypt. Many Egyptians may therefore perceive a renegotiation of the 1929 and 1959 agreements as compromising these important national as well as personal interests. Given the gravity of preferences and interests the Egyptian domestic audience has connected to the Nile it can be assumed that concessions on this issue would be highly unpopular. Making concessions to Ethiopia may be seen as jeopardizing national interests (Dinar, 2002: 246). It appears that maintaining the traditional position on this issue is almost prerequisite for any Egyptian government that wishes to maintain its power. One example of this is that President Mubarak faced quite serious critique when he was perceived as being too permissive on the Nile issue (Tvedt, 2014, [Interview]). The Egyptian win-set regarding renegotiation of rights and allocation of the Nile therefore appears to be very narrow, if it exists at all. Is it plausible that the Egyptian domestic audience can accept any Level 1 agreement between Egypt and Ethiopia?

The Ethiopian Best Alternative To a Negotiated Agreement (BATNA) has, as argued in chapter 4, improved significantly since 1990. Ethiopia is now able to unilaterally engage in hydro-development despite Egyptian objections. Given this improved BATNA it seems implausible that Ethiopia would accept an

agreement that ensures the continuation of the status quo stated in the 1929 and 1959 agreements. Ethiopia has through statements and action made it clear that any new agreement concerning rights and allocations of the Nile must imply a real change from "natural and historic rights" towards "equitable utilization". This appears to be way outside the Egyptian win-set regarding this issue. Although a renegotiation as soon as possible appears to be the rational choice in the Level 1 negotiations, this appears to be highly irrational in Level 2 negotiations based on the short assessment of the Egyptian win-set.

This assessment of the Egyptian win-set is, as previously mentioned, based on a few selected key factors. This means that there is a possibility that the true Egyptian win-set is broader than acknowledged by the analysis on the previous pages. It seems fair to argue, however, that the Egyptian win-set is too narrow to overlap with the Ethiopian BATNA. Without such an overlap an agreement becomes impossible and the conflict ends in a deadlock (Putnam, 1988: 440-441). Where does this leave Egypt?

6.3 The Egyptian Win-Set and Room for Maneuver

Egypt currently finds itself in a very difficult situation. The only viable means of curbing Ethiopian hydro-development is an international agreement, a renegotiation of the 1929 and 1959 agreements. This alternative comes, however, with considerable if not unbearable domestic political costs. The limited win-set constrains the array of actions the government may take. It appears that Egypt has become *entrapped*. It seems unlikely that the government could accept a new agreement even if it wanted to.

Entrapment as a concept in the study of international relations and negotiations generally refers to a situation where one or several actors maintain or even increase their commitment to a previously chosen and failing course of action to justify or recover previously made investments (Meerts, 2005: 112-114; Brockner and Rubin, 1985: 5). This is not, however, the primary mechanism that has resulted in entrapment for Egypt (although continuous investments in land-

clearance projects potentially can contain some of this dynamic). Egypt appears to have become entrapped by the combination of very narrow, or nonexistent, win-set regarding a renegotiation of the 1929 and 1959 agreements and a more powerful Ethiopia with hydrological ambitions willing and able to realize these ambitions unilaterally if needed.

6.4 The Egyptian Position the Result of Internal Factors

Chapter 4.0 sought to explain the Egyptian refusal to renegotiate the 1929 and 1959 agreements by assessing the balance of power between Egypt and Ethiopia. In this chapter it was concluded that significant changes in the balance of *issue-specific structural power* indeed have occurred between the two states in Ethiopia's favor. Ethiopia has since the late 1990s or early 2000s become increasingly able to ignore the Egyptian de jure claims in the 1929 and 1959 agreements. Chapter 5.0 argued that Egypt has three primary options in the new context resulting from the change in the balance of power. Simple game-theoretic models were used to assess those three alternatives and it was concluded that a rational actor would choose a renegotiation and cooperation rather than maintain the current position of refusing renegotiation, given the assumptions made in the models. The Egyptian BATNA has become considerably worse off and it should therefore be expected that Egypt would renegotiate in the late 1990s or early 2000s. This has, off course, not occurred.

The third, and last, analysis has discarded the assumption of the state as a unitary actor in order to be able to assess the importance of domestic factors on the Egyptian position. Based on Robert Putnam´s (1988) depiction of international negotiations as two level games and the concept of win-sets this third analysis has sought to assess the influence the Egyptian domestic audience has on Egyptian foreign hydro-policy. If the win-set is small enough this may explain the Egyptian refusal to renegotiate as the domestic political costs of a renegotiation is too high for the government to accept.

The size of the Egyptian win-set regarding a renegotiation of the 1929 and 1959 agreements does appear to be very narrow if not nonexistent. It seems like a significant proportion of the Egyptian domestic audience, regardless of social background, have strong interests and preferences connected to maintaining the status quo stated in the 1929 and 1959 agreements. Many Egyptians perceive renegotiation to be a threat against significant interests or preferences connected to national security, the economy, and national identity. This assessment of the win-set provides nothing more than a rough outline of the true Egyptian win-set. Given the current Ethiopian BATNA it seems highly unlikely, however, that the true Egyptian win-set is broad enough to overlap with that of Ethiopia. Putnam (1988) argues that in cases where the win-sets of the negotiating actors do not overlap the situation ends up in a deadlock. As argued throughout this thesis this is a situation where Egypt is worse off than Ethiopia. Egypt therefore seems to have become entrapped between a domestic audience hostile to a renegotiation and Ethiopia, as well as other upstream states, who can only be curbed by a new agreement and the establishment of a basin-wide cooperative arrangement.

The prospects for a renegotiation have not improved following the political turmoil in Egypt during and after the Arab Spring. Governments generally become more concerned with short-term consequences and more cautious with implementing unpopular policy as a result of concerns with the wishes of the domestic audience (Hovi et al., 2009: 25). It seems fair to add that political tension and instability, as has been seen in Egypt since the beginning of the Arab Spring, increase such concerns further. If renegotiation was difficult before it is arguably more difficult now. The political upheaval can be assumed to have further reduced Egyptian decision makers' room for maneuver, as focus has become short-term political survival (Nicol and Cascão, 2011: 323; Danahar, 2013: 54-58). If a renegotiation was avoided by the Mubarak regime out of concerns of domestic reactions it appears even less domestically rational to renegotiate now.

7.0 Conclusion

This thesis has sought to determine why Egypt throughout the 1990s and 2000s refused to renegotiate the 1929 and 1959 agreements. These agreements constitute the backbone of the hydrological conflict in the basin. The downstream states, Egypt and the Sudan, have traditionally benefitted significantly from the rights and allocations given to them in these agreements. The downstream states, and particularly Egypt, continue to argue that the agreements are valid and that their "natural and historic" rights must be respected. The upstream states on the other hand argue that the agreements are not valid and that a new cooperative arrangement based on equitable utilization of shared water resources must be implemented.

The research design used to answer the research question of this thesis is similar to what Levy (2008) labels a theory-guided research design. The reasoning behind this choice of design is that is allows for an in-depth study of the given case while ensuring some degree of foundation in existing literature and theory.
The data or information used in this thesis was primarily collected through literature studies. This data was supplemented by information collected through semi-structured elite interviews.

Although there are nine upstream states that oppose the validity of the 1929 and 1959 agreements Ethiopia is arguably the most serious contender to the traditional Egyptian hydro-hegemony. Ethiopia is the hydrologically most important state in the basin as between 80-90% of all the water of the Nile that reaches Egypt originates in Ethiopia. Ethiopia has also experienced significant economic growth and political stabilization since the overthrow of the Derg military junta. If Egypt has no reason to renegotiate the 1929 and 1959 agreements with Ethiopia it is unlikely that it would have reason to renegotiate with any other state in the basin.

The analysis of the Egyptian refusal to renegotiate the 1929 and 1959 agreements is based on three distinct, yet interconnected, analyses. The first,

presented in chapter 4.0 discusses changes in the balance of power between Egypt and Ethiopia that occurred between 1990 and 2012 based on a theoretical framework for the study of asymmetric negotiations by William Mark Habeeb (1988). The second analysis, chapter 5.0, outlined three possible options available to Egypt given the changes in the balance of power that were documented in chapter 4.0. Simple non-cooperative game-theoretic models were used to assess the costs and benefits of each option. The third and final analysis, presented in chapter 6.0, showed how internal factors may explain the Egyptian refusal to renegotiate the 1929 and 1959 agreements.

The first analysis concluded that while it seems quite apparent that Egypt throughout the period of interest has had a significant advantage in *aggregate structural power* compared with Ethiopia severe changes have occurred in the balance of *issue-specific structural power* between the two states. This change has since the late 1990s or early 2000s enabled Ethiopia to engage in unilateral hydro-development, despite Egyptian protests. This has affected the two states' Best Alternative To a Negotiated Agreement (BATNA) in this conflict. Egypt has traditionally had the highest BATNA in the basin with a highly beneficial de jure status quo supported with a considerable de facto hegemony. As Ethiopia became able to engage in unilateral hydro-development the Egyptian BATNA weakened, and has continued to do so. The Egyptian alternative to renegotiation is currently an increasingly confident Ethiopia with the ability to develop its hydro-resources in the Blue Nile and other tributaries regardless of Egyptian demands and objections. The current construction of the GERD, which began in 2011, is perhaps the best example of the significant change of the balance of issue-specific structural power that has occurred since the 1990, just two decades ago.

Based on the balance of power Egypt could be expected to have changed its position on the matter of a renegotiation of the 1929 and 1959 agreements. It appears that it has not, despite some initial indications in this direction within NBI. The balance of power can therefore not explain the Egyptian refusal to

renegotiate the 1929 and 1959 agreements after the balance of power turned at some point in the late 1990s or early 2000s.

The second analysis, presented in chapter 5.0, argued that Egypt has three options given the changes in the balance of power that has occurred between Egypt and Ethiopia since 1990 and particularly since the late 1990s or early 2000s. Egypt´s three options in the new context are i) maintain the current position and continue to refuse to renegotiate the 1929 and 1959 agreements, ii) use the advantage in aggregate structural power to pressure Ethiopia to change its hydro-policy, or iii) agree to renegotiate the 1929 and 1959 agreements. The costs and benefits of each option are evaluated using simple game-theoretic models.

The first option, maintaining the current position, is problematic as Ethiopia is assumed to develop its hydro-resources regardless of Egypt´s actions. Unrestricted Ethiopian hydro-development is expected to be associated with considerable negative externality for Egypt. Reducing the effect of this negative externality is highly important to Egypt, which already is suffering from severe shortage of fresh-water resources. The two remaining options are means to reduce this externality, either through pressure or through cooperation.

The second option is also associated with considerable challenges. There are several ways a state can use an advantage in aggregate structural power to pressure another state. Threats of a military character against possible challenges to the Egyptian hydro-hegemony and the 1929 and 1959 agreements seem, however, to be the Egyptian knee-jerk response throughout the period of interests. Ethiopia has in spite of several implicit as well as explicit threats continued its unilateral hydro-development. Although Egypt has a significant advantage in military resources the threats appear to be ineffective. The reason for this seems to be the considerable operational as well as international audience costs associated with the realization of such threats, particularly if they are to ensure long-term benefits. Egyptian threats of a military nature aimed to prevent further Ethiopian hydro-development are in other words not credible.

The third option seems to be the option with the most promise. A renegotiation of the 1929 and 1959 agreements and the establishment of a basin-wide cooperative arrangement are assumed to give Egypt more influence over Ethiopian hydro-development than it currently has. Although such an arrangement may be difficult to establish, let alone maintain, it seems to secure a higher expected payoff for Egypt than the other two options. The best alternative for a rational actor, given the assumptions made in the games assessing the three options, is to accept a renegotiation of the 1929 and 1959 agreements. While this option will require Egyptian concessions regarding "natural and historic" rights as well as the current de jure allocation the price seems relatively low as Ethiopia is currently ignoring these claims anyhow. The fact that Egypt continues to choose option one is somewhat of a puzzle given the changes in the balance of power that have occurred.

The third and final analysis of this thesis, presented in chapter 6.0, uses a different approach to answer why Egypt refuses to renegotiate the 1929 and 1959 agreements. While the two previous analytical chapters relied quite heavily on the assumption that the state is a unitary rational actor, the third analysis does not. Instead it attempts to assess the importance of internal factors on the Egyptian position following Putnam´s (1988) depiction of negotiations as a two-level game. What may appear to be politically rational in the international setting may be highly impolitic and irrational on the domestic level. In order to gauge the Egyptian government's room for maneuver on this issue the Egyptian win-set was analyzed.

The size of a given win-set depends, according to Putnam (1988), on the power and preferences of the domestic audience. As the domestic audience seem united in their position on the Nile issue it is treated as a unitary social unit for analytical purposes. The most significant preferences the domestic audience has associated with the Nile and the status quo stated in the 1929 and 1959 agreements are associated with *security*, the *economy*, and *socio-cultural importance*. It seems like a substantial proportion of the Egyptian domestic

audience perceive Ethiopian hydro-development and the renegotiation of previous agreements as a threat to national security, damaging to the national economy, and near theft of a resource that historically and culturally belongs to Egypt. Given the gravity of these preferences and the apparent distribution of those preferences among the three major socio-political groups in Egypt it seems fair to argue that the Egyptian win-set is very narrow, if not nonexistent. It is therefore very plausible that that the Egyptian win-set does not overlap with that of Ethiopia, as Ethiopia will not accept a new agreement worse than their current BATNA.

The narrowness, or nonexistence, of the Egyptian win-set means that Egypt could not engage in a serious renegotiation of the 1929 and 1959 agreements after the balance of power turned in Ethiopia´s favor. The preferences of the Egyptian domestic audience used to assess the Egyptian win-set seem to have been relevant throughout the period of interest, 1990-2012. It may therefore be the case that the Egyptian government was unable to renegotiate even before the balance of power turned, although it was much less of a problem then. The Egyptian government appears to be entrapped by the combination of a very narrow, if not nonexistent, win-set and an increasingly able and confident Ethiopia.

If this really is the case then a basin-wide cooperative arrangement may be highly difficult to accomplish. Upstream pressure on the downstream states may in fact increase concerns among the Egyptian domestic audience making it even more difficult for the Egyptian government to engage in a meaningful renegotiation, if it should wish to do so. A minimal level of trust, not simply between governments but essentially between nations, must be established before a truly cooperative arrangement can come into being. This will require moderation from the upstream states and a true commitment to cooperation from downstream governments. Finally it can be expected to require a substantial amount of patience. How such a level of trust is to be accomplished must, however, be the topic of future research and reflection. Basin-wide cooperative arrangements have been successfully established in several

international basins. While the characteristics of the Nile Basin may pose particular challenges to such an arrangement, all actors involved could potentially benefit from its establishment. Basin-wide cooperation based on the principle of *equitable utilization* may generate mutual benefits for the eleven states in the basin as well as for the millions of people who have the waters of the Nile as their primary source of fresh-water.

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Appendix 1: Respondents

Name of Respondent	Place	Date
Jonas Ådnøy Holmqvist	Oslo	22.01.2014
Terje Tvedt	Oslo	27.01.2014
Kjetil Tronvoll	Oslo	14.02.2014

All of the respondents have been informed about how the information collected through the interviews is used. They have also confirmed the information used in this thesis through a reference check. Finally, all respondents have agreed to be referenced to by full name.

Appendix 2: Interview Guide

This interview guide was originally written in Norwegian. The guide presented here has been translated into English to enable assessment by non-Norwegian speaking readers.

1.0 Power
Have there occurred changes in the balance of power between Egypt and Ethiopia relevant for the conflict regarding rights and allocation of the Nile waters?
What are in your opinion the main causes of this change?

1.1 Economic and Military
What does the balance of power between the two states in regards to military and economic capability look like?
What will this in your opinion look like in the future?
Is a possible asymmetry large enough to enable Egypt to realize its military threats against upstream states? Why or why not?

1.2 Issue-specific structural power
How significant has China and other possible alternative sources of investment been for Ethiopian hydro-development?
How significant is the upstream signing of the CFA and why?
Is the Sudanese Egyptian relation weakening, why is it doing so, and what are the implications of this?
What are the implications of Ethiopian unilateral hydro-development?

1.3 Egyptian continued refusal
Has the changes that have occurred been severe enough to threaten Egypt, or at least severely harm Egyptian interests?
What are the possible gains and losses Egypt can expect from its unchanging position?

2.0 What can explain the Egyptian position, given that the losses from its unchanging position are quite significant?
What options are available to Egypt in the current situation?
Is the Nile important to Egyptians beyond its instrumental/material importance?
Who are the main actors in the formation of Egyptian hydro-policy?
How important is the (military) security aspect of the conflict for Egypt?
How significant would the internal political cost of a renegotiation be?
Could it be argued that Egypt is entrapped in its current position, or is there hope that things will become better?

3.0 Other
Are there important elements that I have overlooked, literature you would recommend, other possible informants you know of?

Appendix 3: Egyptian and Ethiopian Aggregate Structural Power Data

Table 1: Ethiopian Aggregate Structural Power in the period 1990-2011

		Military Power			Economic Power			
Country Name	**Year**	**Population (in millions)[i]**	**Military Spending (% of GDP)[ii]**	**Total Armed Forces[iii]**	**Real GDP (in million USD)[iv]**	**GDP per Capita (PPP)[v]**	**GDP Growth (%)[vi]**	**Net Development Assistance and Aid (million USD)[vii]**
Ethiopia	1990	51,49	6,5	250000	7494,39	545,24	2,73	1545,17
Ethiopia	1991	53,18	3,96	120000	6992,58	489,46	-7,14	1637,82
Ethiopia	1992	54,91	2,45	120000	6415,95	432,05	-8,67	1646,98
Ethiopia	1993	53,5	2,19	120000	6530,06	472,64	13,14	1577,7
Ethiopia	1994	55,28	2,04	120000	6757,72	472,03	3,19	1510,42
Ethiopia	1995	57,04	1,59	120000	7171,37	485,48	6,13	1151,74
Ethiopia	1996	58,77	1,5	120000	8114,92	529,72	12,43	1073,78
Ethiopia	1997	60,48	2,62	120000	8402,42	530,9	3,13	828,81
Ethiopia	1998	62,17	5,88	120000	8062,51	498,59	-3,46	966,36
Ethiopia	1999	63,87	9,51	325500	8478,73	510,42	5,16	929,54
Ethiopia	2000	65,58	7,61	352500	8993,63	527,3	6,07	1037,42
Ethiopia	2001	67,3	4,35	252500	9740,23	556,43	8,3	1696,84
Ethiopia	2002	69,04	3,72	252500	9887,77	550,65	1,51	1937,77
Ethiopia	2003	70,78	3,26	162400	9674,09	525,48	-2,16	2047,19
Ethiopia	2004	72,53	3,1	182000	10987,09	582,46	13,57	2123,14
Ethiopia	2005	74,26	2,78	183000	12285,64	636,07	11,82	2187,73
Ethiopia	2006	75,99	2,28	160500	13616,74	688,94	10,83	2237,12
Ethiopia	2007	77,72	1,88	138000	15176,68	750,82	11,46	2572,3
Ethiopia	2008	79,45	1,5	138000	16814,02	813,73	10,79	3244,4
Ethiopia	2009	81,19	1,19	138000	18294,07	866,37	8,8	3846,76
Ethiopia	2010	82,95	1,12	138000	20590,08	932,24	9,94	3525,21
Ethiopia	2011	84,73	1,08	138000	22891,7	979,21	7,3	-

i Refers to the total population (World Bank WDI, 2013a).
ii Military expenditures data are derived from the NATO definition (World Bank WDI, 2013b).
iii Armed forces personnel are active duty military personnel, including paramilitary forces (World Bank WDI, 2013c).
iv GDP at constant 2005 prices in US dollars (United Nations Statistics Division, 2013).
v GDP per capita based on purchasing power parity (PPP). PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. The values are given in constant 2005 USD (World Bank WDI, 2013d).
vi The annual percentage growth rate of GDP at market prices based on constant local currency (World Bank WDI, 2013e).
vii Measured in current USD (World Bank WDI, 2013f)

Table 2: Egyptian Aggregate Structural Power in the period 1990-2011

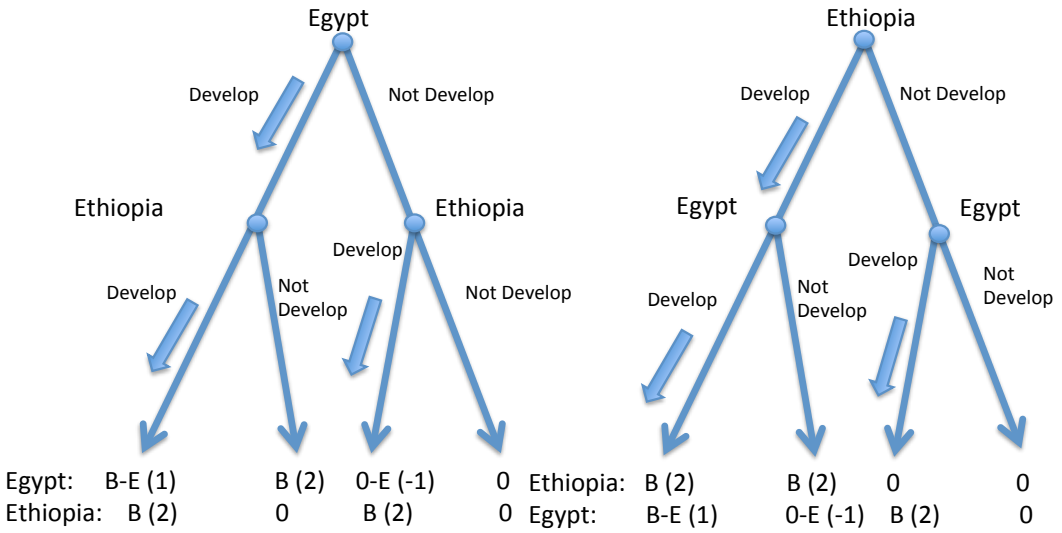
		Military Power			Economic Power			
Country Name	**Year**	**Population (in millions)[i]**	**Military Spending (% of GDP)[ii]**	**Total Armed Forces[iii]**	**Real GDP (in million USD)[iv]**	**GDP per Capita (PPP)[v]**	**GDP Growth (%)[vi]**	**Net Development Assistance and Aid (million USD)[vii]**
Egypt	1990	56,84	4,66	434000	48634,26	3237,32	5,7	9252,65
Egypt	1991	57,95	4,86	434000	51231,97	3209,62	1,08	7964,73
Egypt	1992	59	4,45	424000	54645,77	3292,11	4,43	5233,48
Egypt	1993	60,02	4,38	424000	56232,89	3330,26	2,9	3517,49
Egypt	1994	61,03	4,17	430000	58452,97	3405,19	3,97	3839,58
Egypt	1995	62,06	3,89	610000	61117,07	3504,03	4,64	2561,93
Egypt	1996	63,12	3,49	672000	64244,83	3617,25	4,99	2817,53
Egypt	1997	64,2	3,2	680000	67772,6	3751,74	5,49	2748
Egypt	1998	65,31	3,28	680000	70499,82	3836,86	4,04	2730,53
Egypt	1999	66,46	3,21	680000	74807,29	4000,8	6,11	2226,34
Egypt	2000	67,65	3,19	678500	78834,39	4141,33	5,37	1964,3
Egypt	2001	68,89	3,31	768000	81612,58	4210,58	3,54	1883,26
Egypt	2002	70,17	3,36	773000	84212,36	4231,36	2,37	1741,66
Egypt	2003	71,5	3,34	780000	86834,97	4285,64	3,19	1272,49
Egypt	2004	72,84	3,03	798000	90413,27	4378,55	4,09	1790,48
Egypt	2005	74,2	2,85	799000	94456,32	4490,62	4,47	1173,12
Egypt	2006	75,57	2,74	866000	100920,76	4711,27	6,84	995,68
Egypt	2007	76,94	2,5	866000	108073,85	4955,16	7,09	1159,28
Egypt	2008	78,32	2,29	866000	115807,92	5216,09	7,16	1700,38
Egypt	2009	79,72	2,14	865500	121191,3	5365,11	4,69	984,57
Egypt	2010	81,12	2	835500	127458,27	5543,54	5,15	592,41
Egypt	2011	82,54	1,86	835500	129707,37	5546,53	1,8	-

i Refers to the total population (World Bank WDI, 2013a).
ii Military expenditures data are derived from the NATO definition (World Bank WDI, 2013b).
iii Armed forces personnel are active duty military personnel, including paramilitary forces (World Bank WDI, 2013c).
iv GDP at constant 2005 prices in US dollars (United Nations Statistics Division, 2013).
v GDP per capita based on purchasing power parity (PPP). PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. The values are given in constant 2005 USD (World Bank WDI, 2013d).
vi The annual percentage growth rate of GDP at market prices based on constant local currency (World Bank WDI, 2013e).
vii Measured in current USD (World Bank WDI, 2013f)

Appendix 4: Sequential Hydro-development Game

Egypt and Ethiopia have "Develop" as their strictly dominant strategy in the static 2x2 game presented in Figure 5.1. This would also be true if the game is played sequentially rather than simultaneously. The figure below illustrates the point. Egypt chooses first in the figure to the left and Ethiopia chooses first in the figure to the right. The thick arrows show the

Sequential 2x2 hydro-development game

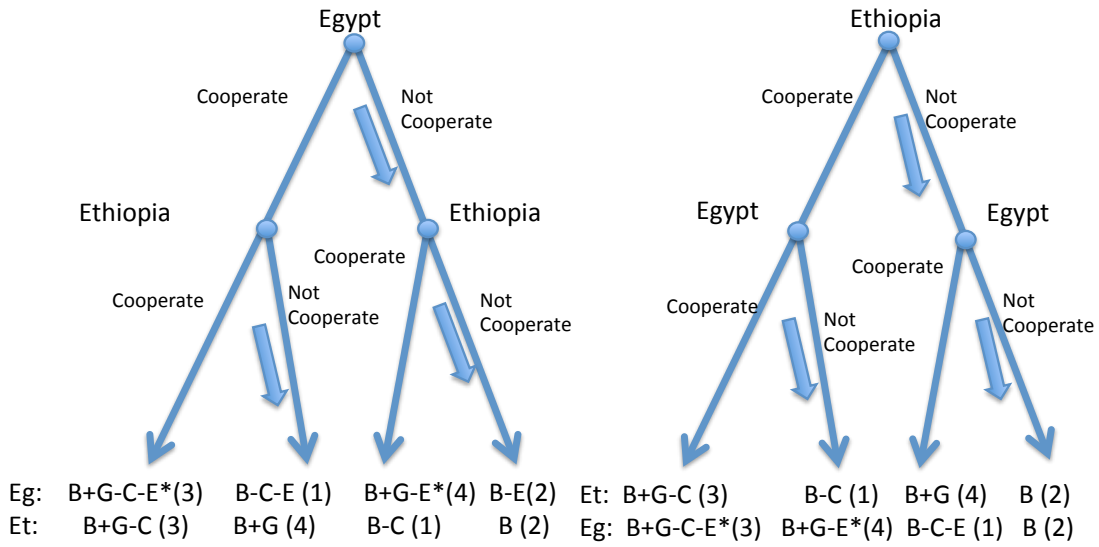


Using backwards induction it becomes clear that the outcome in this sequential game is the same as in the static game. In the figure to the left Ethiopia will choose to Develop regardless of Egypt´s choice (2>0). As Egypt knows this, given the assumption of complete information, Egypt cannot become better off by choosing anything but Develop (1>-1). The same is true in the figure to the right. Egypt will choose Develop regardless of Ethiopia´s choice (2,1 >0, -1). Knowing this Ethiopia can do no better than choosing Develop (2>0). Mutual development is the NE of the game weather or not the game is played with simultaneous or sequential moves, and in the case of sequential moves regardless of who starts.

Appendix 5: Sequential Dilemma Game

In the static cooperation game, presented in Figure 5.3, both Egypt and Ethiopia have "Not Cooperate" as their strictly dominant strategy meaning that mutual non-cooperation is the NE of the game. This is also the case if the game is played with sequential rather than simultaneous moves.

Sequential 2x2 cooperation game



In the figure to the left it is clear that Ethiopia prefers to Not-Cooperate regardless of Egypt´s choice (4>3 and 2>1). Given the assumption of complete information Egypt knows that Ethiopia will have this preference. It cannot therefore do any better than to choose Not cooperate as well. The same logic is found in the figure to the right. Egypt prefers to Not Cooperate regardless of Ethiopia's choice. As Ethiopia knows this is the case it cannot do any better than to choose Not Cooperate (2>1). The NE of the game is mutual non-cooperation weather or not the game is played with simultaneous or sequential moves, and regardless of who starts.